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American Dyestuff Reporter, Vol. 27, No. 20, October 3, 1938. Published every other Monday, Copyright, 1938, by Howes Publishing Co., 440 4th Ave., New York, N. Y. Domestic subscription, $5.00; Canadian, $6.00; foreign, $6.00. Entered as second-class matter. Nov. 6, 1919, at the New York, N. Y., Post Office, under the act of March 3, 1879.

A. P. HOWES
Publisher

M. D. REESER
Advertising Manager

AMERICAN DYESTUFF REPORTER

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Managing Editor

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Official Publication of the American Association of Textile Chemists and Colorists

THE OBJECTS OF THIS ASSOCIATION ARE:

"To promote increase of knowledge of the application of dyes and chemicals in the Textile Industry.

"To encourage in any practicable way research work on chemical processes and materials of importance to the Textile Industry.

"To establish for the members channels by which the interchange of professional knowledge among them may be increased."

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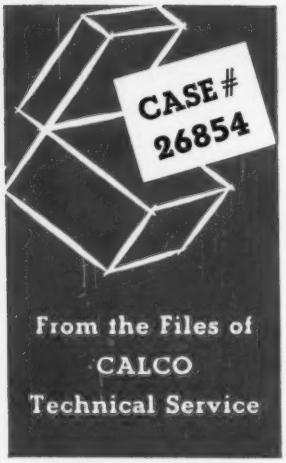
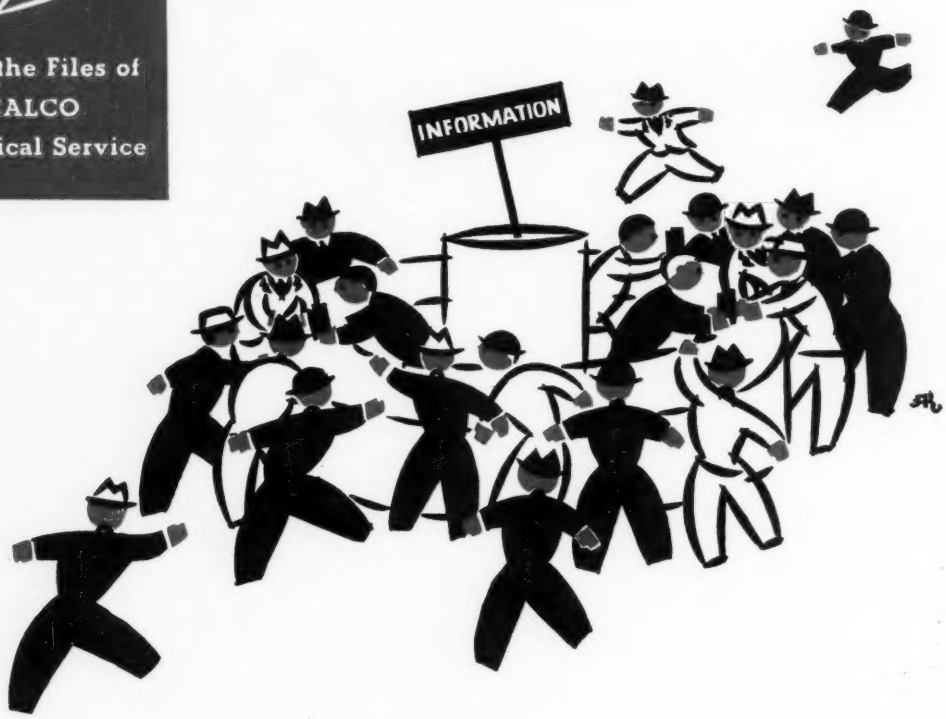


FINDING THE ANSWERS

to Spun Rayon Dyeing Problems



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AMERICAN
DYESTUFF REPORTER

VOLUME 27 OCTOBER 3, 1938 NUMBER 20

Heat for Textile Processing

Steam or Water?

C. H. S. TUPHOLME

IN recent years increasing attention has been paid to the question of the recuperation of the so-called "waste heat" in power plants and its use for heating purposes, particularly in those industries which require heat for processing. The great advantages of these combined power and heat plants are at once obvious when it is considered that with the simplest means and in the smallest plants a thermal efficiency can be obtained three times as high as that of complicated and expensive super power stations.

The first question to arise is whether it is possible, by suitably choosing the conditions, to produce in the combined type of plant the full output required by the installation served by the power plant. In order to approach this ideal the aim is to distribute the heat at the lowest temperature at which it can be used, even if the cost of the heat-using equipment is thereby somewhat increased. The exhaust heat of a steam-driven prime mover can be given up either in the form of steam or hot water. Previously, when low-pressure boilers were used only for heating purposes, it was quite in order to distribute and use the heat as low-pressure steam. Heat interchangers and heating apparatus such as is used in textile operations, were accordingly also developed for steam heating. The time has arrived, however, when much of this type of apparatus is being modernized for warm water heating, which offers much more economical heat utilization in combined plants.

As regards live steam conditions, if it is considered desirable to use the inexpensive single-cylinder turbines in combined plants, the pressure and temperature should not exceed 427 lb. per sq. in. and 750° F., respectively. These can be chosen somewhat higher, referring to the same weight of steam, if back-pressure turbines are used instead of condensing turbines, because the difference in the volume of steam before and after the turbine is then not so great; the gain in power is, however, comparatively small. Even then it would first be necessary to determine whether the initial cost of the boiler, the super heating of the exhaust steam and the small blade lengths which result are admissible.

If, for example, the steam conditions are increased from 427 lb. per sq. in., 750° F., to 710 lb., 875° F., the increase in the heat drop is little more than 80 B.T.U. If, however, the heat is distributed by means of warm water at 140° or 170° F. instead of by back-pressure steam at say 56 lb. per sq. in. then the increase in the heat drop amounts to 436 B.T.U. or 95 per cent, and 305 B.T.U. or 65 per cent, respectively, of the total heat drop. In other words, with warm water operation 93 per cent or 65 per cent more output can be obtained for a given volume of steam.

Should this increase in output not cover the power requirements, warm water operation will still, in most cases, be more advantageous than using an extraction turbine with steam distribution, even although part of the warm water may be lost. Quite apart from the fact that an extraction turbine is a comparatively expensive machine because it is equivalent to a combined back-pressure and condensing turbine, it also possesses the disadvantage that the steam which flows into the condenser, and of which the latent heat is lost, is throttled by the by-pass valves and is not used with the thermo-dynamic efficiency obtained in a condensing turbine.

In order to show the increase in output or saving in coal which can be obtained with heat distribution by means of warm water when compared with steam, steam consumption diagrams for both cases have been made in which a turbine with an output of 1300 KW., using live steam at 340 lb., 665° F. was chosen. The following two typical cases were considered:

(a) Heat distribution by extraction steam at 4216 lb. per sq. in.

(b) Heat distribution by warm water in one case at 125° F., and in another at 175° F.

To simplify matters a constant thermo-dynamic efficiency of 75 per cent was assumed for both solutions because here only a comparison of the gain obtained with a heat plant in cases (a) and (b) is made. According to what has already been said it follows that in case (b) the turbine is actually not only much cheaper, but also has a better thermal efficiency, so that the saving in coal will be even greater than that calculated here. In case

(a) the water is heated by extracted steam at 42 lb. from 60 to 125 or 175° F., while the remaining steam, which is required to produce the desired output, is condensed in a standard condenser at a constant vacuum of 0.7 lb. per sq. in. In case (b), however, the whole of the steam flows into the condenser and the quantity is regulated by the governor. The condenser is built in the form of a heating condenser and allows the water to be heated directly from 60 to 125 or 175° F. This is possible as a result of a special thermostat regulation which has been installed in several of the most up-to-date plants (see Fig. 1). According to this system, the quantity of water flowing through is always regulated by the thermostats to suit the load, so that the water temperature has a maximum variation of ± 30° F. (approx.).

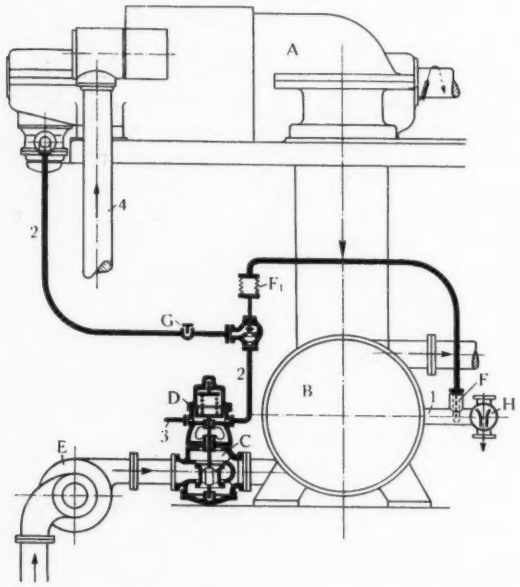

Fig. 1—Turbine with circulating-water regulation to constant outlet temperature.

A.—Turbine.
B.—Condenser.
C.—Regulating valve.
D.—Servo-piston for regulating valve.
E.—Circulating water pump.
F.—Thermostat.
F_1.—Relay for the thermostat.
G.—Adjusting screw.
H.—Water-jet air ejector.
1.—Air-discharge pipe.
2.—Pressure-oil pipe.
3.—Oil drain-pipe.
4.—Live-steam main.

This thermostat regulation design has no rods and the impulses are transmitted by oil under pressure which can be taken from the oil pressure system of the turbine. The tubes in the heating condensers are expanded at both ends, and are given a slight curvature to allow for free expansion. In this way the tubes remain perfectly tight even during maximum variations in temperature. A comparison of the live steam consumption figure for a load of 750 KW. and a desired warm water quantity of 1760 cu. ft. per hour at 125 or 175° F. shows:—

	Water heated from 15 to 125° F.	*Water heated to 175° F.*
Case (a)	10,400 lb. per hour	13,600 lb. per hour
Case (b)	8,100 lb. per hour	11,780 lb. per hour
Saving in fuel, %	22	13.4

In cases where a steam turbine with waste heat recuperation and independent power generation is installed the control system shown in Fig. 2 is used. The thermostats automatically ensure the supplementary steam supply. With a large load and a momentarily reduced demand for warm water the reverse case can occur, namely, when the quantity of warm water produced is too great if a temperature of 125° or 175° F. is to be maintained. According to this system, however, the thermostat allows the surplus warm water to flow through the valve G to the by-pass. This surplus water can be stored up in a reservoir until such time as the demand for warm water increases, or it can of course be allowed to run to waste within certain limits, although even then there is a saving in coal when compared with solution (a).

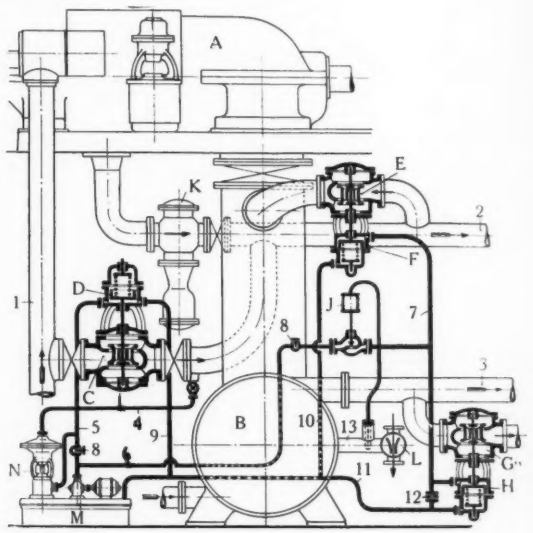

Fig. 2—Steam turbine with waste heat recuperation and independent power generation.

A.—Turbine.
B.—Condenser.
C.—Valve for make-up live steam.
B.—Servo-piston for C.
E.—Valve for make-up heating steam.
F.—Servo-piston for E.
G.—Water circulating valve.
H.—Servo-piston for G.
J.—Thermostat.
K.—Non-return valve.
L.—Water-jet air ejector.
M.—Motor-driven gear oil pump.
N.—Pressure regulator.
1.—Live steam main.
2.—Heating pipe.
3.—Hot water pipe.
4.—Steam pipe to pressure regulator.
5.—Pressure oil pipe to C.
6.—Pressure oil pipe to J.
7.—Pressure oil pipe to E and G.
8.—Oil regulating valve.
9.—Oil drain pipe from C.
10.—Oil drain pipe from E.
11.—Oil drain pipe from G.
12.—Diaphragm.
13.—Air discharge pipe.

The plant shown in Fig. 2 is somewhat complicated because an extraction turbine is provided which cannot only deliver warm water but also heating steam at a definite pressure. The supplementary steam is taken from the extraction pipe 2 and flows into the condenser if the exhaust steam from the turbine is not adequate. The plant is so designed that after the exhaust-steam valve has been closed when the turbine is shut down, throttled live steam can be produced in the heating pipe as well as warm water at constant temperature in the heating condenser. The thermostat and the automatic steam throttle valves C and E receive pressure oil from a special auxiliary oil pump M.

It has been shown that the higher the temperature selected for the warmed water, the smaller must be the surplus which can be allowed above the average daily warm water consumption, if a saving in fuel is to be achieved. But even when the quantity of warm water is less than the above corresponding to 19 per cent extraction at 125° F. or 55 per cent at 175° F., the solution (b) is much superior to (a), when the installation shown in its simplest form in Fig. 3 is realized in practice. The plant operates here alternately in two ways, either producing warm water which is regulated by the thermostats F and G and fed into the reservoir H, or operating on ordinary vacuum, whereby the cooling water is allowed to flow freely into L until the reservoir is empty.

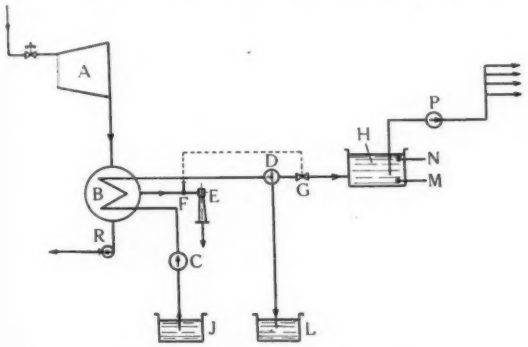

Fig. 3—Independent turbine plant used alternatively for water heating and as a purely condensing plant.

A.—Turbine.
B.—Heating condenser.
C.—Circulating-water pump.
D.—Three-way valve.
E.—Jet condenser.
F.—Thermostat.
G.—Regulating valve.
H.—Warm water accumulator.
J.—Water supply.
L.—Water outlet.
M, N.—Float contacts.
P.—Warm-water distributing pump.
R.—Condensate pump.

As regards transmission of heat in the form of hot water unit heat loss X difference in temperature between heat carrier and main temperature X length of piping gives the total hourly heat loss. For the same diameter of piping the heat loss is greater when using steam, because the temperature of the steam is higher than that of the water. Measurements made with a large number of heating installations show that the loss is considerably below 10 per cent of the heat given off when there is a good load on the plant. When the load is below normal, such as at the beginning and end of the heating period, the heat loss increases so that with remote-heating plants using steam the annual average loss is about 14 per cent for the systems, while with warm water systems the average annual loss is about 10 per cent.

A further advantage of warm water heating is that the temperature of the warm water can readily be made to suit the ambient temperature, while when using steam it is necessary to operate at constant pressure or temperature. With warm water heating plants, the quantity of circulating medium is, therefore, generally practically constant. By this means not only is the heat loss at partial loads limited, but there is a higher vacuum in the condenser and a larger heat drop in the turbine during the transition period, when in any case only a small quantity of live steam is required for heating purposes, so that despite the small heating output it is still possible to obtain a comparatively large power output. The question of heat storage and power equalization can also be more easily solved when using warm water, because an open tank can be used as the reservoir. The heat contained in steam can only be stored in an expensive accumulator, that is, with varying pressure and a decrease in heat drop.

According to the heating arrangement already explained, it is possible to provide the turbine with thermostats so that the correct inlet temperature is obtained automatically. Generally, heating will be continuous as long as the ambient temperature is below +55° F. In order to avoid the pressure and temperature in the condenser rising to too high a value (with hot water plants), a system has been perfected whereby the water which is heated in the condenser receives its final supply of heat through the medium of the flue gases.

It would be uneconomical to design the turbo-set for a maximum heat load which perhaps occurs only once every ten years. Naturally, the boiler plant must be designed for these peak loads, and perhaps also the condenser, if it is not preferable to install an auxiliary heat exchanger. It is possible then by means of the auxiliary valve E (Fig. 2) to supply the necessary throttled live steam to the condenser. The correct dimensions for the turbo-set would, therefore, appear to be those based on a heating output corresponding to the average ambient day temperature calculated from observations taken over a period of as many years as possible.

NOTICE

The Quarterly Research Number, originally scheduled for this issue, will appear October 17, 1938.

TECHNICAL NOTES FROM FOREIGN SOURCES

Organic Hydrogen-Peroxide Stabilizers in Bleaching

R. Folgner—Monats. f. Textil-Ind. 52, 257 (1937).—

(Note: The first part of this review appeared on page 376 of the August 22nd issue of the REPORTER. The following was unintentionally omitted at that time.—ED.)

Certain substances seem to stabilize peroxide by acting as protective colloids—Marseilles soap, starches, gum tragacanth, agar-agar, glucose, proteins and protein solutions, such as glue, gelatine, casein, keratin, albumen, and emulsions containing lecithin (the last especially in the presence of polyvalent alcohols, such as glycerol). Some interesting studies have been made of the stabilizing action of gelatine. Findlay and Thomas concluded that colloids in homogeneous systems do not influence chemical reaction (and this is of course what we call the "decomposition" of peroxide really is) but facilitate the formation of supersaturated solutions of gases, by adsorbing the minute bubbles of gas, electrically charged, by means of the electrical charge of the colloids; which would imply that gelatine does not inhibit the decomposition of peroxide, but prevents its effects from becoming evident. Kubelka and Wagner, in their study, concluded merely that the relationships between colloid and peroxide are too complicated to warrant definite mathematical expression. At all events, it appears that small quantities of gelatin are of more inhibitive effect than comparatively large quantities, a fact which is found to be true also in several other related cases. The degree of inhibition varies with the colloid; starches exert no such effect, casein a less effect than gelatine, sugars only in very high concentration. It is evident that the action is purely a physical one, since the effect is dependant upon the concentration of the alkali and of the gelatine, but not upon that of the peroxide.

Small amounts of hydrogenated hydrocarbons, or of their oxygen or halogen derivatives, added in clear solution or in suspension, have been proposed. It has also been found that all substances, which lower surface tension, act favorably, while all substances which increase it act unfavorably. Accordingly, such a common substance as alcohol has been recommended, as well as more complex products having the same property, such as sulfonates of the higher fatty alcohols or their halogen derivatives (the familiar wetting-out agents). Aryl ethers of the polyvalent alcohols, carbohydrates and their halogen substitution-products, cyclic compounds such as di-oxane, ketones such as acetone, acetyl peroxide, mixtures of sodium pyrophosphate and oxalate, complex derivatives of salicylic acid with sodium phosphate (common) or borax, pyrophosphoric esters of the higher fatty alcohols, sulfonation or phosphatation-products of the higher alcohols prepared in the presence of boric acid, ureas, persulfuric acid esters of the higher fatty alcohols, naphthalene persulfuric acid esters, and finally, the use of peroxide, not in aqueous solution, but in solution in methyl or ethyl alcohols, acetone, pyridine, acetic acid, etc. There are still some hundreds of thousands of other organic substances still awaiting recommendation, evidently!

Modern Views Regarding Textile Washing, and the Constitution of Modern Detergents

Dr. A. Chwala and A. Martina—Mell. Textil-Ber. 18, 725 (1937).—The first part of a paper presented before the 20th Congress of the I.V.C.C. (International Association of Chemists-Colorists) in Salzburg, in June, 1937. Apparently, from its fullness and style, the whole paper is unabbreviated.

The article, in this section at least, is of a highly scientific nature, of a decidedly physico-chemical sort, and is illustrated with one graph, and four tables. It cannot be summarized; to those interested in the above aspect of the subject it should be of value. Dr. Chwala's work upon the topic is well known.

The Mode of Reaction of Prechromed Dyestuffs Upon Wool

Dr. W. Ender—Monats. f. Textil-Ind. 52, 215 (1937). —An abstract from a paper delivered before the general meeting of the V.D.F. and the I.V.C.C. at Frankfurt, July, 1937 (the abbreviations signify the Verein Deutscher Faerber and Internationeller Verein Chemiker u. Coloristen).

In view of the well-known fact that prechromed dyestuffs produce much faster dyeings than do ordinary acid dyestuffs for wool, it seemed of interest to study the problem as to what sort of union is set up between dyestuff and fiber, and particularly as to how the chromium component is involved in the process. The method employed consisted in gravimetric estimation of the amount of free, chromium-containing dye-acid taken up, and the determination of the un-reacted basic groups of the wool by aftertreatment with dilute sulfuric acid (cf. a paper by Dr. Alfred Mueller, entitled "Contributions to the Theory of Acid Wool-Dyeing," to follow in these columns). The author's conclusions are, that first of all only salt-formation takes place between the sulfonic acid groups of the dyestuff and the basic groups of the wool. The kathionic chromium present in the dyestuff molecule then reacts with the still free basic groups of the wool, forming complex salts, the basic groups thereby losing their basic properties. Only perhaps one-tenth of the basic groups present are able to allow this complex salt-formation. The other, unaffected basic groups remain in the uncombined state, and with further amounts of dyestuff form only salts with the sulfonic groups of the fresh portion of dyestuff, there being no further complication with the chromium of the fresh portion. The rate of absorption of such dyestuffs containing one sulfonic acid group is very low, while that of

disulfonated dyestuffs is about equal to that of the average slowly-dyeing monosulfonated ordinary acid wool dyestuffs. Absorption is favored by addition of small amounts of mineral acid (that is, as to the first stage, that of mere salt-formation). The complex chromium salt-formation is favored by the presence of mineral acid, and so level dyeing is favored. By too little mineral acid this complex salt-formation is depressed, and the primary union of sulfonic acid-basic groups is of less stability, so that the fastness properties of the dyeing, especially fastness toward washing, are not so good.

Tendering of Rayon in Discharge-Printing

A. Franken—Monats. f. Textil-Ind. 52, 238 (1937).—The author calls attention to the view that both chemical and physical causes exist which will explain the local tendering of printed rayons. One point raised is that, in the printing, the fiber is bone-dry at the instant at which a raised point upon the printing-roll comes into sudden and strong, even violent, contact with it, and that in this instance we have a case of mere crushing of the fiber and consequent great weakening of it at sharply-limited points, which must be guarded against by careful attention to the pressure to which the roll is adjusted. Another not unrelated case is that in which the goods are exposed to pressure from a printing roll in which, according to the design on the roll, there are considerably sunken areas, with sharply defined boundaries, upon the engraved surface; in such cases the fiber, held firmly by the adjacent raised portions, is exposed sometimes to tension, or to actual drawing or tightening, the tendering being then to be ascribed to undue local overstretching of the weave, the whole area of the weave which represents the sunken areas of the pattern being tendered, instead of the tendering having taken place through undue pressure and crushing along the outline only of such areas.

Most difficulties, however, are due to chemical action, or rather to the presence or absence of various chemical components of the printing-paste. Too little attention, for example, is given to the proper choice of a thickening agent. It is too common a fault to evaluate a thickening agent by its power to produce a smooth paste of a desired viscosity, and by that point only. Equally important is the power of the thickening agent to act as a finishing agent also—to impart a certain softness and flexibility to the goods when they are finally dry. Again, carelessness in the addition of too much caustic—anything more than is absolutely necessary, is sometimes noticed, its result being the conversion of the fiber to the notoriously fragile oxycellulose, where such a paste has touched the weave. And another point to be considered, less obvious, is the danger inherent in overdrying rayon weaves. After steaming, the goods should be passed through a cooling chamber, in order that they may not issue into the air in a hot-steamy condition, and so lose their natural moisture as well as the moisture from the steaming process. By ordinary thoughtful care regarding these and similar points, tendering of printed rayons should be completely avoidable.

—♦ ♦—

The Processing of

Acetate and Viscose Rayon Fabrics

C. B. ORDWAY, M.S.

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Part II—The Bleaching and Finishing of Acetate and Viscose Rayon Crepes

(Continued from August 8, 1938, issue)

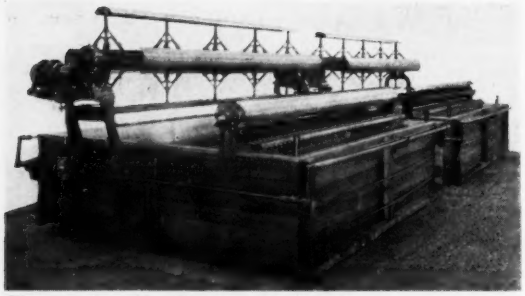
THE boiled-off or creped acetate and viscose rayon goods as they come from the boil-off and scouring (washing) operations are entered directly into boxes or dye-becks ready for bleaching or dyeing operations. The bleaching operation is usually carried on in boxes, though some plants with sufficiently large production carry on their bleaching operations on a hook-up similar to the Washing and Scouring unit used in a Continuous Boil-off operation in connection with a rope-washer. In the bleaching of acetate and viscose rayon goods, one must consider carefully the effect of the different bleaching processes on these manufactured (synthetic) fibers that make up the goods under process. These are some of the points that bear careful watching:

1—The viscose rayons are sensitive to acid processing baths, more so to mineral than to organic acids.

2—Overbleaching or excessive amounts of bleaching agents are dangerous to both of the fibers, (acetate and viscose).

3—The acetate rayons are sensitive to high temperatures and alkaline baths.

4—Temperature control and time element are two of



Photo, courtesy, Van Vlaanderen Machine Co.

Fig. 8—Stainless Steel Lined Dye Beck with a Square Reel.*

the essential factors that the chemist and bleacher must carefully study for successful bleaching.

5—Processing water free from iron, organic matter, and other undesirable agents is of prime importance.

These are some of the major factors that must be taken into account before a suitable bleaching method can be determined upon and then carried through economically and rapidly as is consistent with production of properly bleached goods for satisfactory finishing.

The necessity of satisfactory water for textile processing operations is becoming of more vital importance to all successfully operated plants today than ever before. The desirability of laboratory control of water treatment will be discussed under a later section of this series.

Tests on clarified water from the average city water mains that have been given only a soda ash and alum treatment which is used in the majority of city water systems provide a water that tests 7.6 to 8.8 pH. The waters test more to the alkaline side than toward acid or neutral; this is to prevent corrosion to pipe-lines.

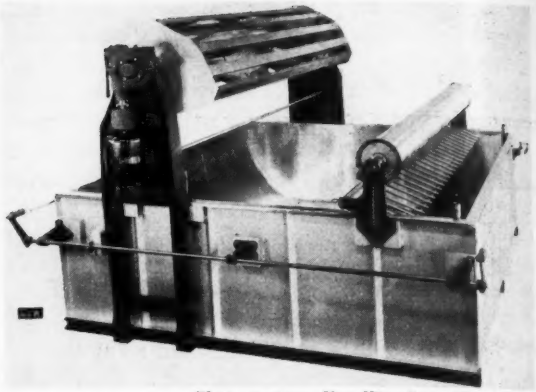
The temporary "hardness" of the waters will vary in some textile centers from 15 to 45 PPM. Some locations may claim so-called "zero hardness" for their respective water supplies but this is not usually the actual fact when you start operating a plant.

Clarified waters of this type, run through a zeolite water softening system, maintain approximately the same pH as the raw clarified waters that enter, though the "hardness" drops to 3 to 7 PPM or a so-called "zero-hardness" textile processing water. This variance in PPM hardness when checked by titration is shown to be due largely to the condition of the zeolite bed in the water softener and whether it is over-loaded, clogged-up, or not properly back-washed.

PRE-SCOURING BEFORE BLEACHING OPERATION

The creped goods are usually given a pre-scour of 30 to 60 minutes at 180° F. to 200° F. in order to remove all

*These are the widest used types of dye becks or boxes. The oval reel is used to a greater extent than the square type. Some plants cover their dye becks with wooden frames, windows front and back, as the covering aids in reducing steam costs and preventing spotting of light shades and whites under processing.



Photo, courtesy, Van Vlaanderen Machine Co.

Fig. 9—All Stainless Steel Dye Beck with an Oval Reel.*

foreign matter such as dirt, metallic salts, iron rust, fatty matter, and sizing materials that might be left in goods from the boil-off and scouring operations. This pre-scour is of real value for producing quality work as it leaves a "clean-bottomed" fabric to be entered into the acid or alkaline bleaching liquor according to the bleach method that is used.

TYPICAL PRE-SCOUR FORMULAS

(All formulas in this article will be based on a 12 foot box with an approximate capacity of 1300 to 1450 gallons
5400 to 6000 liters
The amount of goods that can be run on this type of box will vary from 25 to 40 pieces or 450 to 650 pounds.)

English Measures

0.75 to 2.25 lbs. soda ash or tri-sodium phosphate
0.75 to 2.25 lbs. sulfated fatty alcoholate paste
or
0.37 to 1.12 lbs. sulfated fatty alcoholate powder

Metric Measures

0.05 to 0.15 grams/liter
0.05 to 0.15 grams/liter
or
0.025 to 0.075 grams/liter

If water is not zeolite softened and has a "hardness" of 20-40 P.P.M., it is best to use,

Four to 10 pints hexa-meta-phosphate solution—30 per cent 0.3 to 0.75 cc. per liter. In case goods have a tendency to float or pile up on the back-board, it is advisable to use:

0.75 to 2.25 lbs. Penetrant—0.05 to 0.15 grams/liter

This pre-scour formula is suitable for all types of subsequent bleaching operations, but goods to be run on a chlorine bleach (acid bath method) can use this method as "fool-proof" and be free of soap-spots or other similar troubles that arise from failure of machine operative to fully rinse and remove all traces of soap and fatty matter used in scouring formulas containing sulfonated oils and soaps.

The plant chemist or dyer can substitute soap or highly

(Continued on page 552)

PROCEEDINGS OF THE

American Association of Textile Chemists and Colorists

OCTOBER 3, 1938

Officers of the Association

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Eavenson & Levering Co., Camden, N. J.
DUNCAN FERGUSON—ARTHUR R. THOMPSON, JR., *Vice-Presidents*

WILLIAM R. MOORHOUSE, *Treasurer*
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Lowell Textile Institute, Lowell, Mass.

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Lowell Textile Institute, Lowell, Mass.

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HOMER WHELCHEL (South Central)
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John N. Dalton, Secretary, Pacific Mills, Worsted Division, Lawrence. Mass.

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Lowell Textile Institute Student Section
Herman T. Buckley, Chairman; Robert A. Lemieux, Secretary.

North Carolina State College Student Section
J. E. Spainhour, Chairman; J. A. Holder, Secretary.

Philadelphia Textile School Student Section
Newton Monschein, Chairman; Bernard Menin, Secretary

Members should notify the **Secretary** immediately of all address changes

Report of the Nominating Committee

FOR election in the fall of 1938 the Nominating Committee presents the following candidates:—

President—Alban Eavenson.

Vice Presidents—Duncan Ferguson and Arthur R. Thompson, Jr.

Treasurer—William R. Moorhouse.

Councilors at Large—Peter J. Ariente and R. S. Wheeler.

In accordance with the Constitution, counter nominations for any office, signed by at least ten Active members, may be filed with the Secretary of the Association not later than November first, and if so filed, will be printed on the ballot.

Signed,

A. F. Beane, South Central Sec.
A. T. Brainerd, Mid-West Sec.
Elliot Broadbent, Rhode Island Sec.
Ephraim Freedman, New York Sec.
A. H. Gaede, Piedmont Sec.
A. K. Haynes, Southeastern Sec.
C. A. Seibert, Philadelphia Sec.
W. H. Zillessen, No. New Eng. Sec.

Textile Waste Treatment*

H. G. BAITY**

WE are grateful to your program committee for the invitation to present to you a subject of great importance to the entire textile industry, with which you as textile chemists and colorists are well acquainted and about which you are in best position to give advice to the industry which you represent. I am not attempting to present a paper. My informal remarks will be general and superficial and in the form of an introduction to the gentlemen who follow me with a technical paper.

This subject of water pollution by industrial wastes is one that has become prominent within relatively recent time. During the pioneer days of this country, when our resources of every kind were apparently limitless, when exploitation was practiced—when we cut down the forests, tilled the ground, exhausted it, and moved on to another frontier—there was no occasion to be concerned about the preservation and conservation of the basic national resources. In those days of sparse population and meagre industrial development the pollution of our streams presented no serious problem. Until relatively recently, certainly within the last seventy-five year period of the rapid industrialization of the country and high degree of increase of population, this matter of stream pollution has been more or less overlooked and forgotten. In some sections it has been forgotten entirely too long. In many cases the streams are beyond redemption and the agencies responsible for their highly polluted character are the ones who are themselves possibly suffering most from that condition.

Stream pollution is a matter of significance not only from the standpoints of public health, esthetics, public decency, recreation, and wild life conservation, but it also becomes a matter of great economic importance. Within recent years several industries, and the textile industry in particular, are taking cognizance of the present and potential damage to their plants and processes by the pollution of streams either by themselves, sister industries, or municipalities. In many sections of the country stream pollution has gone so far as to cause great hazards and economic loss to many types of industry, particularly the industry with which you people are connected. The textile industry, with its present-day demand for high degrees of purity and clarity of water for modern processes, has run into many situations where it is almost impossible to maintain and guarantee an acceptable quality of water, due to the pollution upstream of water supply sources.

It is recognized that, due to natural topographical conditions, our streams must necessarily serve the various and manifold uses for water of populations and industries located on their watersheds. These uses include domestic and industrial water supply, recreation, wild life propagation, natural drainage, and ultimate disposal for the sewage of municipalities and the waste products of industries. So, in order to conserve streams in a quality suitable for such uses, the waste materials from cities and industries must be treated to such a degree as to make them susceptible of being taken care of by stream self-purification processes without over-taxing the assimilative capacity of these streams or doing violence to their quality.

The pollutional characteristics of textile wastes are not widely different from all other types and kinds of liquid wastes received by streams. There are three primary effects produced upon receiving streams by all such wastes that are deserving of mention here. Without attempting to enumerate these in any order of significance I mention the following: (1) Toxicity to stream life; (2) Oxygen depletion in stream water; and (3) Physical impairment of stream conditions.

The chemical nature of textile processing wastes often produces a toxic condition in the receiving stream which is not only destructive to fish and aquatic life of that character, but has the effect of killing the bacteria and various other forms of biological life upon which stream self-purification processes depend. Numerous situations exist where industrial wastes of toxic nature are either killing the fish life or preventing the development of such life. However important this may be, it is considered that the inhibition of normal stream self-purification agencies is of very much greater significance.

Most industrial wastes contain large amounts of organic constituents, materials that are unstable and tend to serve as food for bacteria in stream waters. This process of decomposition results in the abstraction of dissolved oxygen from the water for the support of the bacterial life. Such use of oxygen may be so great as to result in its complete exhaustion from the water. Thereupon, putrefaction sets in and a septic condition is created, accompanied by the characteristic effects of black unsightly color, bubbling gases, and noxious odors.

The third characteristic of most industrial wastes, and particularly the wastes from textile processes, is one that is not of great hygienic importance, but of utmost importance to the layman and the man bringing suit against the industry,—that of physical appearance. The average citizen does not usually attach great importance to the really significant matters of hygienic quality, toxicity, and biochemical oxygen demand, but bases his estimate of pollution almost entirely upon such physical evidences as

*Presented at meeting, Piedmont Section, May 7, 1938.

**Professor of Sanitary Engineering, University of North Carolina, Chapel Hill, N. C.

color, turbidity, and the presence of odors and floating materials. Consequently the problem of color removal assumes undue importance in the matter of handling textile wastes. It is the yardstick by which the layman judges damage.

The gentlemen who follow me in this symposium will go more deeply into these problems.* I will skip along and attempt to comply with the program committee's request in giving you a brief chronology of the interest and work in textile wastes treatment in North Carolina. In this connection I want to pay tribute to two gentlemen in this audience who, in the early twenties before other interest was manifest, did significant work in this field. I refer to Messrs. Souther and True of the Proximity Manufacturing Company at Greensboro, North Carolina. These gentlemen developed a process for treating certain types of wastes and through publication called attention to the existence of this important problem.

Early in the 1920's the North Carolina State Board of Health, observing the very rapid increase in textile processing in this State and foreseeing the consequent aggravation of stream pollution problems, took cognizance of the situation by sending the author to New England to get the panacea for all the textile waste ills. It was assumed that in New England, where the textile industry had concentrated itself for a long time, ways and means had been scientifically developed for solving every such problem. Over a two-year period, scores of plants were visited in regions where stream pollution was greatest. In general, it was found that remedial treatment processes were being applied on a trial and error basis without scientific or experimental background. Some of the plants were working satisfactorily while others, constructed at great expense, were performing functions wholly incommensurate with their cost. Practically no experimental work was in progress and, in general, no helpful records were being kept upon the plants that were in operation. So, when the State Board of Health was thus disappointed, it was concluded that the best and only thing to do was to start right here in North Carolina in an effort to develop basic information pertaining to this problem, which apparently was not in existence elsewhere.

In 1925, the North Carolina State Board of Health began a series of comprehensive studies on several of the more important streams of the state which were known to be receiving large amounts of municipal and industrial wastes. In that way they were able to evaluate the effect produced upon stream conditions by the discharge of various textile processing liquors. Simultaneously with these stream studies, and in close cooperation with the textile industries of the state, they made a survey of representative mills producing typical wastes of various classifications to procure basic information regarding processes employed, the amount of various wastes produced, the domestic sewage equivalent of such wastes, and the physical, chemical, and biochemical nature of these waste materials. From the 459 textile plants in the state at that time, 49 were selected as producing what were considered representative processing wastes. In these 49 plants accurate measurements were made of the various wastes produced, and factors were developed for the expression of the waste production in the processing of one hundred pounds of goods of various classifications. Several thousand samples of wastes were analyzed in a central laboratory and average values deduced for expressing the physical, chemical, and biochemical characteristics. It is unfortunate that, due to several causes, most of these data have not found their way into print, where they might be utilized by the textile industry and designing engineers.

It may be interesting to note that the State Board of Health survey indicated 459 textile plants in the State of North Carolina in 1930, representing a capital investment of $276,450,000 and an annual value of manufactured products amounting to $412,100,000. Up to that time $140,711 had been spent in this state on waste disposal by the following agencies: $7,000 by the State Board of Health and the State Department of Conservation and Development, $20,500 by municipalities on experimental plants and stream investigations, $7,250 by industries and cities jointly, and $85,961 by industries for non-workable plants.

The State Board of Health survey also indicated that, of the 459 mills in the state in 1930, 147 of them discharged a total of fifty-nine million gallons per day of waste liquor, a flow amounting to approximately that of the twenty largest cities in North Carolina. About 7,200,000 gallons of this total could be classified as concentrated objectionable wastes. The rest was wash water of lesser consequence. From a pollution standpoint, of the concentrated waste, kier liquor accounted for 4,000,000 per day, direct color wastes for 865,000 gallons, sulphur dye liquors for 935,000 gallons, while miscellaneous strong wastes amounted to 1,400,000 gallons per day.

The next movement along this line, one which was, in fact, contemporaneous with the State Board of Health studies, was the establishment of a textile wastes fellowship at the University of North Carolina by the City of Durham, N. C., which was then faced with the problem of handling the industrial wastes produced within that city. The question occurred to them, as it usually occurs to every municipality and its industries, as to whether the industrial wastes and domestic sewage could be handled jointly, or whether it would be necessary to separate part, or all, of the wastes for individual treatment. They had in mind at that time the construction of a large sewage treatment plant and, in order to provide basic information upon which this plant could be intelligently designed, they established this fellowship to make a study of that subject. Mr. A. M. Worth was

*A paper by Henry J. Miles and Ralph Porges followed. This will be published at a later date.

secured as a research fellow who, from 1927 to 1929, worked under the direction of the author in the laboratory at Chapel Hill and the pilot plant located in Durham. Some excellent results were developed and published, and his work, I am glad to say, provided the basis upon which the new million-dollar Northside Durham Sewage Treatment Works have been designed and built. Moreover, this fundamental research has done much to provide the City of Durham an intelligent policy relating to the mutual responsibilities of the city and its industries for the treatment of industrial wastes.

In 1930, a conference was held here in Greensboro between representatives of the State Department of Health, the University of North Carolina, the City of Greensboro, and the Cone textile interests, in an attempt to give birth to a research program of general nature on this subject. At the time there was a promise of a five-thousand-dollar annual grant from the Chemical Foundation for textile wastes research, provided regional textile industries would match that amount. I am sorry to say that when this proposition was presented to the North Carolina Cotton Manufacturers Association, this organization did not see fit to provide the funds for the launching of the investigation.

However, in 1931, the University of North Carolina obtained from the Chemical Foundation a one year grant, small in amount, but sufficient to put one graduate student to work making certain fundamental investigations. A young chemical engineer, Mr. H. F. Chrisco, was awarded the fellowship and he spent several months studying the chemical precipitation of various textile wastes. The results of this investigation have been applied satisfactorily in many cases and were published in Sewage Works Journal.

In 1932, the Textile Foundation, which is a semi-governmental agency in Washington operated on receipts from certain patents seized during the World War, granted a junior fellowship paying a stipend of $750 a year for the furtherance of this research. An excellent investigator, Mr. M. S. Campbell, was the recipient of this award and worked from 1932 until 1935 single-handedly, and with no budget during most of this time except the stipend which he received. The University of North Carolina provided laboratory facilities, experimental equipment and supervision of the work. In spite of his handicap, Mr. Campbell developed some excellent results which found publication in the five articles which are cited at the end of this paper. Beginning in 1933, we constructed a series of pilot plants consisting of small units which could be adapted and combined in such a way as to duplicate any of the customary sewage and waste treatment processes. These units are now in use at the Textile Waste Research Station located near the Proximity Print Works in Greensboro.

Following the resignation of Mr. Campbell in 1935, the Board of Directors of the Textile Foundation considered it desirable to have conducted a survey on a national and international scope to determine the present status of information relating to textile wastes treatment and to determine and describe treatment methods which were being satisfactorily employed. Professor John C. Geyer of the University of North Carolina and Mr. William Perry were engaged to make this study. An Advisory Committee was appointed to shape the scope of this survey and to advise the Textile Foundation as to further researches that should be undertaken. This committee consisted of the following persons: Dr. C. R. Hoover, Wesleyan University; Dr. Willem Rudolfs, New Jersey Agricultural Experimental Station; Professor T. R. Camp, Massachusetts Institute of Technology; Mr. H. W. Streeter, U. S. Public Health Service; Mr. Hill Hunter, General Manager of Cone Mills; Professor A. H. Grimshaw, North Carolina State College, and Professors A. M. White, F. K. Cameron, and H. G. Baity of the University of North Carolina. This committee continues to serve the Textile Foundation in an advisory capacity.

Messrs. Geyer and Perry devoted approximately one year to the study of literature on this subject, to the visitation of plants throughout this country and to the preparation of a report. This report which has been published by the Textile Foundation under the title "Textile Waste Treatment and Recovery" is designed primarily for the information and benefit of textile manufacturers. Its first section is devoted to a non-technical statement of stream pollution principles, the pollutional characteristics of textile processing wastes and the general principles involved in the treatment of these wastes. The second part of the bulletin is more technical in nature and contains a wealth of information valuable to designing engineers and operating personnel. A comprehensive bibliography is appended. So great has been the demand for this publication that the Foundation has recently found it necessary to print a new edition of 2,500 copies. Anyone interested in obtaining a copy of the bulletin may procure it from Mr. Edward T. Pickard, Secretary, The Textile Foundation, Commerce Building, Washington, D. C.

The above mentioned report shows that, while there are many treatment plants throughout the country doing a successful job, most of them were not designed upon a scientific basis and that there really exists no scientific body of information relating to this subject. As a result, the Foundation has become convinced of the desirability of carrying forward a research program on a greatly extended basis and to attack the problem in a more fundamental way and on a broader front than was able to be done by a single man working on a year-to-year fellowship basis. Consequently, in 1936, the Foundation made an appropriation of $10,000 to be used primarily

in the employment of competent fulltime investigators and agreed that the studies should be divided into two main parts: one pertaining to the fundamental chemistry of the question, to be carried on under the direction of Dr. F. K. Cameron in the Department of Chemistry of the University of North Carolina; and the other phase of the work, of a more practical and experimental nature, to be conducted in the pilot plant located in Greensboro, under the direction of the author. Six fulltime investigators have been engaged at the two places during the past two years and both phases of the investigation are producing valuable results that are finding their way into literature through several published articles.

The investigative work now in progress is of a type which should be conducted and financed by the industry itself. The Textile Foundation, in taking the lead in this matter and financing the development of basic information and factors of general application, deserves the gratitude of the textile industry at large. The results of these investigations, in which the Textile Foundation has so far invested approximately $50,000, are not going to solve every particular situation; because every problem is a different one. It is unlikely that there are any two situations in the nation where the problems are identically the same, or where they can receive the same method of handling. However, it is expected that this research will develop certain general principles and procedures, basic in character, which may be used and further developed in connection with specific industrial situations. The subsidy of the Foundation must soon come to an end; it is hoped that industry itself will take up the work at this point and carry it forward.

There has been a recent inspiration of interest on the part of manufacturers in the subject of industrial wastes disposal, caused by the various stream pollution bills which have been pending before the Federal Congress during the last two years. Two quite different points of view are represented in this legislation. One, represented by the Vinson Bill, proposes a Federal stream pollution agency which will carry on investigative work and function in an advisory capacity with the states, but leaving to the states themselves the establishment of standards and the setting up and execution of stream conservation programs. The other point of view is represented by the Lonergan Bill, which proposes that a central Federal agency to be established in Washington shall be authorized to establish national standards and carry out its preventive and remedial stream conservation program by mandamus proceedings, if necessary.

The Vinson Bill passed the House of Representatives in the last session of Congress. In the Senate an amendment was added incorporating the mandamus method of enforcement, and passed the Senate in this form. It is now in the hands of conferees representing the Senate and the House for the reconciliation of these antipodal differences. One thing is sure, that shortly we shall have some kind of Federal stream pollution law on the statute books. When that time comes it will be highly desirable for industry to have the basic information with which intelligently and economically to conform to whatever regulations are enforced.

I realize that I have taken up entirely too much time in what was supposed to be an introduction of the gentlemen who follow me. I have enjoyed the opportunity of being here with you, and I hope you are going to enjoy the real information on this subject that Messrs. Miles and Porges will give you.

Bibliography of Textile Waste Studies in North Carolina

True, A. O. "Disposal of Wastes from Dye Houses and Textile Operations." *Journal American Water Works Association.* Vol. 11, pp. 896-903 (1924).

N. C. State Board of Health. "Textile Wastes as Related to Stream Pollution and Sewage Treatment." (Unpublished Report.)

Trice, M. F. "Hosiery Mill Waste as Related to Stream Pollution and Sewage Treatment." *Journal N. C. Water and Sewage Works Association.* Vol. 9, pp. 85-110 (1931).

Trice, M. F. "Proximity Textile Waste Studies." (Unpublished Report on file with N. C. State Board Health.)

True, A. O. "Disposal of Industrial Sewage." *Journal N. C. Water and Sewage Works Association.* Vol. 5, pp. 71-77 (1927).

Worth, A. M. and Baity, H. G. "Studies on the Treatment of Combined Sewage and Textile Wastes." *Journal N. C. Water and Sewage Works Association.* Vol. 6, pp. 128-150 (1928).

Chrisco, H. F., White, A. M., and Baity, H. G. "The Effect of Precipitants on Textile Waste Liquors." *Sewage Works Journal.* Vol. 5, pp. 674-684 (1933).

Campbell, M. S. "Studies of the Treatment of Industrial Wastes." (Unpublished Thesis, University of North Carolina, 1932.)

Campbell, M. S. "Disposal and Recovery of Textile Wastes, Part I." *Textile Research.* Vol. 3, pp. 490-504 (1933).

Campbell, M. S. "Disposal and Recovery of Textile Wastes, Part II." *Textile Research.* Vol. 4, pp. 29-42 (1933).

Campbell, M. S. "Chemical Precipitation of Color Shop Waste." *Textile Research.* Vol. 5, pp. 240-251 (1935).

Campbell, M. S. "Bleaching and Dyeworks Waste Waters." *Canadian Textile Journal.* Vol. 51, p. 32 (1934).

Geyer, J. C. and Perry, W. A. "Textile Waste Treatment and Recovery." Bulletin published by Textile Foundation, Washington, D. C., 120 pages, (1936, Reprinted 1938).

Geyer, John C. "The Effect of Industrial Wastes on Sewage Plant Operation." *Sewage Works Journal.* Vol. 9, pp. 625-634, (1937).

Miles, H. J. and Porges, Ralph. "Treatment of Sulfur Dye Waste by the Activated Sludge Process, Part I." *Sewage Works Journal.* Vol. 10, pp. 322-335 (1938).

Miles, H. J. and Porges, Ralph. "Treatment of Sulfur Dye Waste by the Activated Sludge Process, Part II." Submitted for publication in *Sewage Works Journal.*

Fundamental Properties of Textile Wastes (Series)

I—Foreword—F. K. Cameron, *Textile Research,* Vol. 8, p. 189, (1938).

II—Electrophoresis, J. E. Magoffin, *Textile Research,* Vol. 8, p. 191, (1938).

III—Gas Bubbles, P. H. Burdett, *Textile Research,* Vol. 8, p. 226, (1938).

IV—Flotation, B. R. Clanton, *Textile Research,* Vol. 8, (1938).

V—Flotation from Ferric Oxide Sols., B. R. Clanton, *Textile Research,* Vol. 8, p. 301 (1938).

VI—Electrophoresis of Platinum and Gold Hydrosols, J. E. Magoffin and H. T. Hatch, *Textile Research,* Vol. 8, p. 305, (1938).

VII—Electric Charge on Escaping Gas Bubbles, P. H. Burdett, *Textile Research,* Vol. 8, p. 353 (1938).

VIII—The Flotation of Colloidal Suspensions, J. E. Magoffin and B. R. Clanton, *Textile Research,* Vol. 8, p. 357 (1938).

Proposed New Constitution

American Association of Textile Chemists and Colorists

ON Dec. 4, 1936 the Council voted that the President appoint a committee to recommend comprehensive rewording of the Constitution of the Association to accord with present needs and practice. President Cady appointed William R. Moorhouse Chairman, H. C. Chapin, C. Z. Draves, J. C. Hayes, and W. M. Scott. He himself served as a member ex-officio. President Eavenson reappointed this committee, adding Mr. Cady as a regular member.

On June 1, 1938 the following petition was presented to the Council. "The undersigned present herewith, for your consideration, an amendment to our Constitution which is substantially a complete revision. We also submit a proposed draft of by-laws, as if and when the proposed amendment to the Constitution is adopted, it will be necessary for the Council under this amendment to adopt by-laws governing their actions.

Signed, W. R. Moorhouse, Wm. H. Cady, H. C. Chapin, Carl Z. Draves, Alban Eavenson, H. F. Herrmann, Arthur E. Hirst, Alfred R. Macormac, Louis A. Olney, R. M. Ritter, Robert E. Rose, Walter M. Scott, Harold DeW. Smith, Ben Verity, Edward Weber, P. J. Wood.

Since that date the proposed Constitution, with minor revisions, has been approved by W. H. Cady, H. C. Chapin, C. Z. Draves, A. Eavenson, D. Ferguson, S. L. Hayes, N. H. Grotelueschen, H. F. Herrmann, A. E. Hirst, E. H. Killheffer, A. R. Macormac, W. R. Moorhouse, D. C. Newman, L. A. Olney, S. I. Parker, R. M. Ritter, R. E. Rose, R. E. Rupp, W. M. Scott, H. DeW. Smith, T. R. Smith, A. R. Thompson, Jr., Ben Verity.

Regret has been expressed in both committee and Council meetings that a larger and more generally representative group could not assemble for construction and initial discussion of the proposed Constitution, which is now published for the approval or criticism of the entire membership of the Association. To promote orderly and constructive criticism the committee suggests that debate in the Annual Meeting be confined to proposed changes presented in form of complete alternative wordings for entire Sections, signed in each case by at least ten Active members, and delivered to the Secretary of the Association not later than Nov. 14. If received in time, such proposals will be published in the Reporter before the meeting. An important object in writing a new Constitution was to eliminate details which might require subsequent revision, leaving these to by-laws to be adopted by the Council, subject to amendment by letter ballot of entire Council. Apparent omissions therefore have been, or can be, corrected in the by-laws, which will be published for comment by the entire membership before adoption by the Council.

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS CONSTITUTION

Article I—Name and Government

Section 1: The name of this Association is The American Association of Textile Chemists and Colorists.

Section 2: This Association is a corporation chartered under the laws of the Commonwealth of Massachusetts.

Section 3: The Association shall be governed by this Constitution and By-Laws.

Article II—Objects

Section 1: The objects of this Association shall be:

To promote increase of knowledge of the application of dyes and chemicals in the Textile Industry.

To encourage in any practical way research work on chemical processes and materials of importance to the Textile Industry.

To establish for the members channels by which the interchange of professional knowledge among them may be increased.

Article III—Membership

Section 1: The membership shall consist of Senior, Junior, Associate, Student, Honorary and Corporate Members.

Section 2: Senior Members only shall have the right to vote, hold office and make motions in the Association.

Section 3: Members of all grades shall be elected by the Council.

Article IV—Qualifications for Membership

Section 1: A Senior Member shall be a person not less than twenty-six years of age with at least five years' experience in the application of dyes or chemicals in the Textile Industry, or in manufacture of or research in dyes, chemicals or fibers for use in the Textile Industry, or in the testing of textile products; except that the Council may at its discretion elect as a Senior Member a person possessing exceptional training and experience which may be of value to the Association.

Section 2: A Junior Member shall be a person who

has insufficient age or experience to be a Senior Member but is engaged in a qualifying pursuit.

Section 3: An Associate Member shall be a person who cannot qualify for Senior or Junior Membership but is interested in the objects of the Association.

Section 4: A Student Member shall be a person who is enrolled in an educational institution of established standing, and engaged principally in a course of study leading to qualifications for Junior and Senior Membership.

Section 5: An Honorary Member shall be a person who has rendered distinguished service to the Textile Industry.

Section 6: A Corporate Member shall be a corporation or other organization which is interested in the objects of the Association.

Article V—Council and Officers

Section 1: The affairs of the Association shall be managed by a Council.

Section 2: The Council of the Association shall consist of a President, two Vice-Presidents, a Secretary, a Treasurer, the Past Presidents, and Sectional Councilors representing and elected by their Sections on a basis of proportionate Senior Membership to be specified in the By-Laws, provided that each Section shall have at least one Councilor.

Section 3: The Council shall have full control of the affairs of the Association, subject to the limitations of the Constitution and By-Laws. The Council may make and alter By-Laws for the Government of the Association. Twenty-five per cent of the members of the Council other than Past Presidents shall constitute a quorum, in the counting of which quorum Past Presidents at the meeting shall be included.

Section 4: The President and each Vice-President shall be elected to serve for one year. A person shall not serve for more than three years consecutively as President, or as a Vice-President, or as a Sectional Councilor.

Section 5: The Secretary and the Treasurer shall be appointed by the Council.

Article VI—Nominations and Elections

Section 1: Nominations for the offices of President and each Vice-President shall be made each year by a Nominating Committee consisting of the Sectional Councilors. The Secretary of the Association shall serve as Secretary of the Nominating Committee, but without vote. A report of the Nominating Committee shall be published in the proceedings of the Association before September fifteenth.

Section 2: Additional nominations for any elective office signed by at least twenty-five Senior Members may be filed with the Secretary not later than October eighth.

Section 3: The Secretary shall mail to every Senior Member by October fifteenth a ballot bearing the name of every nominee. Ballots marked and returned to the Secretary by November fifteenth shall be counted before December first by the Secretary and two tellers appointed by the President, and shall elect officers for the term beginning January first.

Article VII—Meetings

Section 1: The Council shall designate the times and places of general meetings of the Association, but the intervening period between meetings shall be not more than twenty months.

Section 2: The Council at each general meeting shall present a report of its proceedings since the last preceding general meeting.

Section 3: Meetings of the Council shall be called through written notice to each of its members as provided in the By-Laws.

Article VIII—Amendments

Section 1: Amendments to this Constitution may be proposed in writing, signed by twenty-five or more Senior Members and presented to the Secretary of the Association by May fifteenth of any year. Such proposals shall be submitted to the Council and shall be published in the proceedings of the Association, with the recommendations of the Council, before September fifteenth. The proposed Amendment shall be placed on the ballot for the election of officers. Approval by two-thirds of the ballots marked and returned by November fifteenth shall make the proposed Amendment effective on the next following January first.

Section 2: Any changes in the order or number of the Articles or Sections of the Constitution required by an Amendment shall be made under the direction of the Council.

Section 3: This Constitution shall supersede all previous rules of the Association.

Section 4: When the Secretary shall have reported this new Constitution adopted by letter ballot of the membership, the Council elected under the old Constitution shall meet to adopt By-Laws and to determine the number of Councilors to be elected by each Section for its proportionate representation. Councilors at Large elected under the old Constitution shall hold office until the adjournment of this meeting. New Sectional Councilors required to fill vacancies at this time shall take office thereafter upon their election. The President, Vice-Presidents, Secretary, Treasurer, and Sectional Councilors elected or appointed under the old Constitution shall so remain until others are elected or appointed at times and in the manner prescribed in the new Constitution and By-Laws. Terms of office under the old Constitution shall be counted under the three year limitations of Article V, Section 3, of this Constitution; with years as a Councilor at Large counted equivalent to years as a Sectional Councilor.

Three years after adoption, this Section 4 of Article VIII shall be omitted from future printings of the Constitution.

MEETING, SOUTHEASTERN SECTION

THE Southeastern Section held its regular Autumn meeting at the Officers' Club, Fort Benning, Columbus, Georgia, on Saturday evening, September 10, 1938. There were about 140 members and guests present.

The party assembled in cars at the Memorial Stadium, Columbus, Georgia, and then drove to Fort Benning and spent about a half hour in a tour of the Fort. Dinner was served at the Officers' Club at 7:30 P. M.

The meeting was called to order by the Chairman, Mr. R. W. Philip, at 8:30 P. M.

Mr. Philip announced the following committee chairmen for the National Meeting in Atlanta, December 2nd and 3rd: Exhibit and Souvenirs, W. B. Griffin; Banquet, A. K. Haynes; Reservation and Registration, G. H. Small; Publicity and Printing, Earle Mandlin; Reception and Transportation, J. C. Robertson; Entertainment, P. G. Wear; General, R. W. Philip. He then called on Mr. Allen Jones to outline the plans for this two-day meeting at the Atlanta-Biltmore. A short discussion followed during which Mr. Philip gave some details of the expenses involved and financial arrangements being made. He reminded the members that although this would be our only meeting as a Section before the National Meeting, he would keep in touch with the membership frequently and call on them for assistance of various kinds. He especially emphasized that all members in the vicinity of Atlanta would be put to work. There being no other business to come before the Section, Mr. Philip introduced the first speaker of the evening, Mr. W. G. Ware, Superintendent of Dyeing, Mooresville Cotton Mills, Mooresville North Carolina.

Mr. Ware gave his prepared paper on "The Raw Stock Dyeing of Cut Staple Rayon." This was followed by a brief discussion of several points in Mr. Ware's paper.

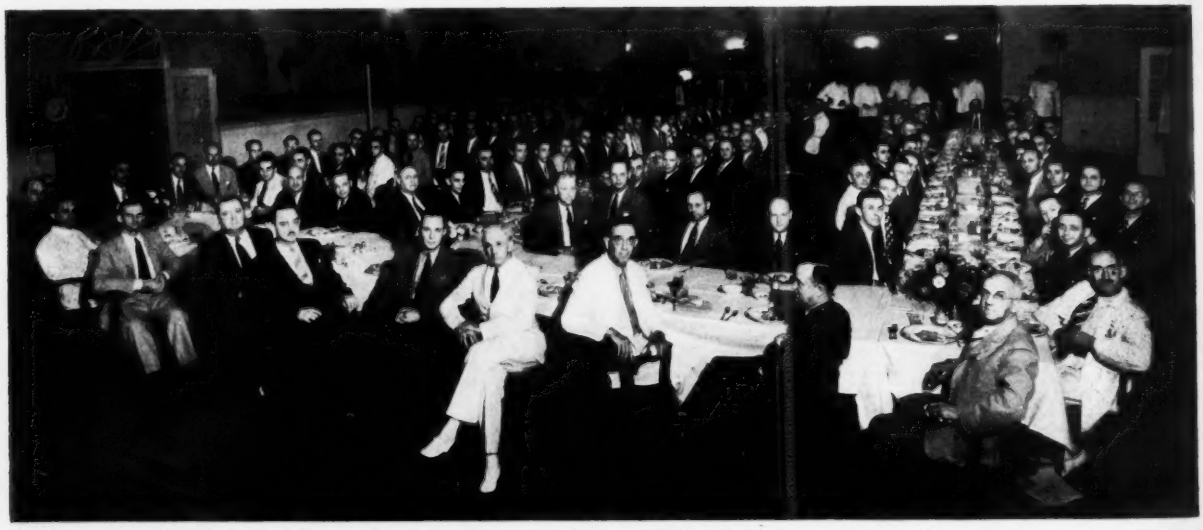
Mr. Philip then introduced Mr. Fuller Callaway, President of Callaway Mills, of LaGrange, Georgia. Mr. Callaway gave an interesting and inspiring extemporaneous talk on "Business Ethics." He emphasized the manner in which ethics may change with changing conditions and are frequently crystallized into conventions, and finally laws.

The meeting adjourned at 10:45 P. M.

Respectfully submitted,

A. R. MACORMAC, *Secretary.*

MEETING, SOUTHEASTERN SECTION, OFFICERS' CLUB, FORT BENNING, COLUMBUS, GA.



At the speakers' table, from right to left: A. R. Macormac, Alabama Polytechnic Inst., Auburn, Ala., Secretary; W. E. Hadley, Standard-Coosa-Thatcher Co., Chattanooga, Tenn.; W. Fred Crayton, E. I. du Pont de Nemours & Co., Columbus, Treasurer; Allen Jones, Superintendent, Muscogee Mfg. Co., Columbus, Vice-Chairman; Paul K. McKenney, President, Swift Manufacturing Co., Columbus, Ga.; Fuller E. Callaway, Jr., Robert W. Philip, Editor of "Cotton," Chairman; W. G. Ware; Russell B. Newton, Superintendent, Bibb Mfg. Co., Columbus; W. W. Pike, of Columbus Chamber of Commerce; and J. E. Ashmore of Columbus "Enquirer-Ledger."

CALENDAR OF COMING EVENTS

Meeting, Mid-West Section, Bismark Hotel, Chicago, Ill., October 8, 1938.

* * *

Meeting, Piedmont Section, Hotel Charlotte, Charlotte, N. C., October 8, 1938.

Meeting, New York Section, Swiss Chalet, Rochelle Park, N. J., October 28, 1938.

* * *

Meeting, Philadelphia Section, Penn Athletic Club, Philadelphia, Pa., October 28, 1938.

* * *

Annual Meeting and Convention, Atlanta Biltmore Hotel, Atlanta, Ga., December 2 and 3, 1938.

AMERICAN
DYESTUFF
REPORTER

A. P. HOWES
Publisher

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Published biweekly by
HOWES PUBLISHING CO., INC.
440 Fourth Avenue, New York City

Subscription price: $5.00 per year. Canadian, $6.00; foreign, $6.00

Vol. 27 October 3, 1938 No. 20

IMPORTANT NOTICE
Re: Quarterly Research Number

THIS issue of the REPORTER was originally intended to be a Quarterly Research Number. Due to unavoidable circumstances the material, which was scheduled to appear in this issue, is not yet ready for publication and consequently we are unable to issue at this time a research number. It is hoped that this material will be ready for publication in our issue of October 17th.

Third Annual
PROCESSING REVIEW NUMBER

THE Third Annual Processing Review Number of this publication will appear under date of November 28th, 1938, just preceding the Eighteenth Annual Meeting of the American Association of Textile Chemists and Colorists, convening this year at the Atlanta-Biltmore Hotel, Atlanta, Georgia, on December 2nd and 3rd.

In this issue, as in previous ones, we shall review the progress which has taken place in the textile wet processing field during the last year. Experts in the specialized branches will prepare articles discussing progress in their particular sphere. Also, we will review all new products —dyestuffs, textile chemicals, laboratory equipment and wet processing machinery—which have been introduced since the last processing review number was issued. In this connection manufacturers of these products are invited to submit information concerning the products which they have brought out during the past year. This information should include the trade name and *briefly* the uses for which the product is intended. In order to insure publication in the November 28th issue such information should be in our hands no later than the first of November.

HAROLD DAVIES ROBERTS

IT is with deep regret and sorrow that we announce the tragic death of Harold D. Roberts, our earliest Canadian member, and practically a charter member of the American Association of Textile Chemists and Colorists. He was one of the founders of the Canadian Association of Textile Chemists and Colorists, and for several years had ably served the Quebec Section as its chairman.

It was my good fortune to be intimately acquainted with Mr. Roberts during the past three years. One rarely meets a man who combined more graciously the qualities of a gentleman and congenial companion with the serious mindedness of business and science.

To me, the announcement of his death was a decided shock. Every member of the American association who knew Mr. Roberts will join me in expressing our sympathy to his bereaved family, to his business associates and to his many friends throughout Canada.

LOUIS A. OLNEY.

The following obituary is reprinted from the Canadian Textile Journal:

The accidental death of H. D. Roberts, manager of the Converting Division of Dominion Textile Co., Ltd., while motoring from Montreal to his home in Magog, Quebec, on the evening of September 1st came as a severe shock to his many associates and friends and it is with deepest regret that we record his passing.

Affectionately known as "H.D.," Mr. Roberts had spent nearly 25 years in the service of the company at Magog Print Works and latterly at its head office in Montreal, and during that time he built up an enviable reputation as an outstanding technician and administrator and a friend of all constructive movements for betterment of the industry.

The accident occurred at a level crossing near Magog where Mr. Roberts' automobile ran into a Canadian Pacific freight train and was wedged between two cars and carried about two miles. The train crew was unaware of the tragedy until the engineer noticed the twisted steel on the right of way.

The late Harold Davies Roberts was born in Manchester, England, in 1884, and after his preliminary education was trained as a textile chemist. After some years' practical experience in the English textile printing and dyeing industry he came to Canada, joining the Magog Print Works as assistant superintendent in the year 1915.

Beginning his career in Canada he displayed outstanding technical and administrative ability and in a short time was promoted to plant superintendent. After the World War plans were made for a major expansion of the plant and in 1927 its production capacity was doubled under Mr. Roberts' direction.

He was likewise in charge of further plant expansion programmes in succeeding years and he saw the Magog output of printed and dyed cottons and rayon increase from 36 million yards in 1929 to around 65 million yards

in the twelve months ended March, 1938. Today the Magog plant can produce 80 million yards of cloth annually.

With an outstanding record of plant direction and administrative ability it was natural that Mr. Roberts' talents should be used in a wider sphere of service. In 1933 he was appointed manager of converting operations with direction of Magog Print Works, Magog, Que., the Colonial Bleachery, Montreal, and the dyeing division of the Montmorency Branch. He also acted in an advisory capacity in relation to the converting division of The Montreal Cottons, Ltd.

Well known, popular, and highly respected he engaged in much social activity in Magog. He organized the Magog Tennis Club for plant employees and maintained it on a profitable basis and organized other sports activities. He was a prominent member of the Hermitage Golf and Country Club and an ardent golfer. Any sports or social activities in Magog that were enjoyable and constructive were supported by "H.D."

For many years he had been a prominent Mason and had held very high offices. Likewise he was on the council of the Canadian Association of Textile Colourists and Chemists since its inception in 1936. He was largely responsible for the Quebec C.A.T.C.C.'s present constitution. In the field of textile research he displayed an active and untiring interest and performed outstanding services.

In the death of H. D. Roberts the textile industry has lost one of its outstanding technicians and executives. An appreciation by G. B. Gordon, managing director, Dominion Textile Co., Ltd., expresses the deep regard of the company he served so well and is as follows:

"The sudden and tragic death of H. D. Roberts has been a terrible shock to all his associates in the company and to a wide circle of friends and acquaintances.

"Mr. Roberts was the manager of one of the two main manufacturing divisions of the company, and the loss the company has suffered is incalculable. He joined the company 23 years ago, coming out from England to take up the position of assistant superintendent at the Magog Print Works. He became superintendent shortly afterwards and, in that capacity, saw the plant develop under his charge to one of the largest of its kind on the continent. As his reputation grew, he had many opportunities to join other and larger concerns in the United States or abroad, but his heart and roots were in Magog, and he stayed with this company. For the past five years he has been manager of converting operations with the direction of three plants.

"In addition to his great technical and administrative ability, Mr. Roberts was one of the most popular men in the company and in the community of Magog, where he spent so much of his life. He had the confidence and respect of all with whom he came in contact, and the sudden termination of a life so full of usefulness and bringing so much happiness to others is indeed very sad."

The Processing of

Acetate and Viscose Rayon Fabrics

(Continued from page 542)

sulfonated castor oils for the sulfated alcoholate where subsequent bleaching operations are to be in an alkaline bath such as the buffered alkaline chlorine and peroxide bleaches. They may use identical formula only replacing the sulfated alcoholate with a sulfated oil or a low titer soap. These products must possess excellent rinsibility for satisfactory processing.

SUBSTITUTE FORMULA

2.25 to 4.5 lbs.—soap-low titer—0.15 to 0.30 grams/liter.

or

0.75 to 1.5 lbs. penetrant or highly sulfated castor oil 0.05 to 0.10 gram/liter.

(The penetrant or oil should be of acid and alkali resistant type.)

If the goods tend to float or pile up on back-board of box, it is best to enter only half of the oil or soap at the start or use only the penetrant; then raise the bath to 180-190° F. and add in the additional agents required. By watching this carefully an operative can prevent goods from excessive rubbing and tension, thus allowing them to *sink* quickly and *carry through* the bath without excessive stretching and chafing of fabric. Excessive tension and pulling in the pre-scour, bleaching, and dyeing operations can easily cause high losses of the shrinkage that has been obtained on the goods in the boil-off and washing operations.

The goods should be given 30 to 60 minutes in pre-scour bath; then flush over bath, gradually cooling goods with running cold water. When goods are cold to operative's hand, drop bath, rinse cold, and prepare fresh bath for bleaching operation.

On various lots of creped goods, the writer has observed colorations or stains remaining on goods after the crepeing operations. These colorations can sometimes be traced to an over-usage of the boil-off and washing baths and the accumulation of tinting agents from the greige goods and other colored materials which will deposit on the creped goods as they go through the washing opera-

tion. There are some tinting agents that appear to be removed satisfactorily, but if the creped goods are not wrapped with white clothes and kept "wet-down" all the time before entering the next wet processing operation, these stains will reappear wherever the creped goods are left exposed to air and become partially dried out in spots.

To prevent these colorations on the goods, it has been found best to add to pre-scour bath:

5 to 10 lbs. hydrosulfite powder—0.35 to 0.75 gram/liter and the soda ash used on formula is usually doubled when the hydro is added. The goods are given the regular scouring time until all colorations are stripped or discharged. This leaves goods with satisfactory bottom for bleaching.

The addition of hydrosulfite can be made to the boil-off and washing operations, but it is rather costly to make this addition to all boil-off baths on the supposition that all tinting agents used will not be removed in these regular operations without the hydrosulfite in the bath. The usual commercial practice is to check each lot of creped goods and if not free of colorations, then add the stripping agents in the pre-scour bath.

METHODS OF BLEACHING

No. 1—Chlorine Bleach—Acid bath or "Buck" bleach.

No. 2—Chlorine Bleach—Alkaline bath with "buffered" chlorine bleaching liquor.

No. 3—Peroxide Bleach—(alkaline bath).

No. 4—Permanganate bleach—(not suitable for acetate fabrics).

Method No. 1—Chlorine Bleach in Acid Bath

(If water is hard it is best not to make correction for this hardness with Calgon or other phosphate salts on this particular bleaching formula.)

1.75 to 3.5 qts. chlorine bleach liquor 0.3 to 0.6 grams per liter.

(100 per cent available chlorine)

3.0 to 6.0 qts. acetic acid (56 per cent) 0.7 to 1.2 ccs. per liter.

Run the goods 45 to 80 minutes in cold bath, sample, and sour in laboratory to see if goods have run sufficient time in the acid bleach bath. If test shows O.K. then wash over bath twice with cold water and prepare fresh bath for anti-chloring or souring operation.

It is advisable to check the strength and pH values of each container of chlorine bleaching liquors if they are bought in the prepared sodium hypochlorite solution form. These bleach liquors will usually range from 12 to 15 per cent available chlorine content. From the laboratory result, one can quickly calculate the necessary amounts required for the bleach based on 100 per cent available chlorine content.

pH values of 4.5 to 5.6 have been found to give good results and it will help to check the bleach baths for this range when preparing the baths as well as during the bleaching operation. Due to the varying pH values of the water supply and hypochlorite solutions, it is necessary to check each bleach bath at the start and through out the operations to obtain uniform results on bleached goods.

Anti-chloring (souring) bath

2.5 to 4 qts. hydrochloric acid—commercial 0.2 to 0.3 cc. per liter. Start bath cold, raise to 120° F. and run 30 minutes, sample goods, and if sample checks satisfactorily with standard, then wash over 3 to 6 minutes, drop, wash cold twice or until goods are free from acid. (Test in laboratory on sample of goods taken.)

Tinting Bath

Make fresh bath and use the *pre-scour* formula for bath.

Acetate Violet B..... 2 to 5 grams
Acid Violet 4BN..... 2 to 5 grams
or
Direct Sky Blue FF..... 2 to 5 grams

Start bath cold, strain in tinting colors, raise to 160° F., run 1 hour, sample goods, dry and check for suitable white against standard. If satisfactory, wash and cool goods gradually, and bag or bundle from this in white cloths from this final rinse bath unless a special finish is added after tinting. If special finish is to be added, the addition may be made directly to the tinting bath or a fresh bath prepared for it. In such a case, the finish should be run in a cold or luke-warm bath. Otherwise the tinted goods may be "greyed" by heating up again.

The acetate and acid colors usually work to advantage for tinting crepes.

In place of hydrochloric acid as an anti-chloring agent, this formula is preferred by many bleachers. The hydrochloric acid may tender the viscose rayon fibers and render harsh both acetate and viscose so as to make it difficult to soften satisfactorily in the finishing.

1.5 to 4.5 lbs. Bisulfite of soda 1.2 to 3.6 grams per liter. Start cold, raise to 120-130° F., run 30 minutes or necessary time for, wash over twice to cool, prepare fresh bath for acetic acid treatment to remove bisulfite and chlorine.

1.5 to 3 qts. acetic acid—56 per cent—0.3 to 0.6 cc. per liter.

Start cold, raise to 130° F., run 30-45 minutes or necessary time to remove sulfur dioxide and chlorine from goods, sample and test in laboratory to see if they are free of chlorine especially, then wash over till cool, drop bath, and give final tinting as described previously.

There are many valuable anti-chloring agents, but these two formulas offer typical processing methods used in practice.

Method No. 2—Chlorine Bleach in Buffered Alkaline Bath

On weight of goods	*On 12 foot box*
8-12% Buffered chlorine bleach.....	6-9 Gallon
2% Pine oil penetrant.....	6-9 Quarts

1/4% Sulfated alcoholate paste..... 1 Quart

On metric measures

4-6 grams per liter

1 cc. per liter

0.1 gram per liter

Enter pre-scoured goods at 90° F., raise to 110° F., run 20 minutes, raise to 160° F. and run 40 minutes. If satisfactory white is obtained, then wash over until goods are cooled. If white is not correct, raise bath to 200° F. and make small addition of buffered chlorine solution and dilute on addition to bath. Run 20-30 minutes additional for correct bleach and finish up ready for tinting bath.

It is always best to test goods for trace of chlorine. Makers of these buffered chlorine bleaches claim that the chlorine is all removed from bath and goods. It is well however to be safe and give a bisulfite and acetic acid anti-chloring, before tinting. Tinting is carried out as described under Method I.

The "buffered" chlorine solutions offered on the market vary from 8 to 15 per cent available chlorine content. The bleaching action is improved by having a full "head" of suds in the box during the entire operation and it is advisable to use a more stable penetrant than average types of soluble pine oil found on the market.

Method No. 3—Peroxide Bleach (alkaline bath)

12-18 quarts hydrogen peroxide (100 vol.)—2.7 to 4.0 cc. per liter.

½ to 1½ pints of silicate of soda—0.05 to 0.15 grams (cc.) per liter.

1 to 2 pints penetrant (resistant to peroxide bleach)—0.1 to 0.2 grams per liter.

1 to 2 pints sulfated alcoholate paste—0.1 to 0.2 grams per liter.

Before entering the penetrant and alcoholate paste, the bath should be adjusted to a pH value of 9.4 to 9.8, then enter these products diluted.

Start bath cold. This allows sufficient time for bleach solution to penetrate through out the goods, raise slowly to 160° F. and run 2 hours, sample goods and dry for "white." If sample is not satisfactory, check pH again and correct to this range given, raise to 170-175° F. and run 30 minutes longer. Sample again; the second sample is usually found to be a much improved "white" and can pass satisfactorily.

The bath is washed over until goods are cool; then bath is dropped; a hot rinse at 120° F. is given for 5 minutes; then cold rinse, and the goods are ready for the tinting bath as described in Method I.

This method requires a heavier tinting than Methods No. 1 and No. 2.

It is dangerous practice to run a peroxide bleach bath on acetate and viscose rayon crepes at 175° F. and higher for 1 to 3 hour periods, as the goods may become seriously tendered, as some types of viscose rayons as well as acetate rayons are more easily affected than others.

Method No. 4—Permanganate Bleach

This method is not suitable for crepes, as it yellows the acetate fibers. It is useful for stripping down streaked and heavy shades to be reprocessed. The processing must be handled with care as it is rather obnoxious when too much sulfur dioxide gas is liberated in a plant.

Discussion of Bleaching Methods and Results Obtainable

Method No. 1, using the "buck" or acid chlorine bleaching bath with suitable anti-chloring agent, gives a very clear and desirable "whites" that require only short tinting periods.

Method No. 2, using the "buffered" (alkaline chlorine bath), is economical as to time required for bleaching operation, but does not give as clear and desirable a "white" as method No. 1. It is more expensive as to chemicals required for processing.

Method No. 3, using peroxide bleach is economical as to time required for carrying through the operation, but gives the least clear "whites" of these three widest used methods and it requires heavy tinting to make it suitable for finishing. This method while the most expensive as to chemicals used, is advantageous from the standpoint of its greater freedom from "iron-rust" and other metallic spots and stains that might be on the goods and tend to over-oxidize or stain that portion of goods in methods No. 1 and No. 2.

The final tinting of the bleached goods may be carried out on the box as described in methods No. 1 and No. 2 and No. 3, or this tinting bath can be omitted on the boxes and the goods tinted on the quetsch.

Tinting on the quetsch offers the possibility of more uniform tinted white goods from lot to lot, but it would require a heavy expenditure for quetsches as well as a dryer just for whites. Due to this reason, this method of tinting "whites" is run only in the larger plants where they maintain bleaching departments separate from the colored work.

FINISHING OF WHITES

The bleached goods may be routed from the final tinting operation through the various steps in finishing as follows: (variations of this routing are usually made for different types of goods.)

1—*Hydro-extraction*

Sufficient time for whizzing so as to reduce moisture content to approximately 100 per cent of the dry weight of the goods.

2—*Opening of Goods*

Goods opened over a large reel can accommodate several strings of goods with an opener operative and one more to operate sewing of pieces together. The small type of reel for opening goods accommodates only one line of goods. The opener operative in the latter case opens, feeds and sews the pieces together.

The goods run over a large opener are folded in boxes ready for entering dryer. Goods opened on small opener

may be fed directly into dryer over the reel or folded into box ready for drying.

3—*Drying of Goods Without Finish*

Folded goods from boxes are fed in open-width into dryer (air-lay, loop, or net type of dryer). The dryed goods are rolled onto a shell at end and are ready for initial inspection.

4—*Inspection of Goods Before Finish Is Applied*

A quick inspection of one or more rolls from each lot of goods is given to check "whiteness" and cleanness of goods before they are passed ready for final finishing operations. If goods are spotty and not satisfactory, they are returned for reprocessing.

5—*Framing for Initial Desired Width*

Goods usually run over short tenter frame, to steam, and give necessary width preparatory to applying the finish.

6—*Finish Applied on Quetsch*

The temperature of applying the finish depends upon the type of goods, and finish to be used. Temperatures varies from 90° F. to 140° F.

7—*Drying of Goods with Finish*

This drying operation is usually carried out in the dryer most suitable for finish used.

8—*Inspection of Goods after Finish Is Applied*

Quick inspection of goods to check effect of finish on desired shade of white. If not satisfactory they may be returned to finisher for reworking or to bleacher for reprocessing.

9—*Final Framing to Desired Width*

Goods are given final framing usually on longer tenter frames with sufficient "setting" on width to permit allowable shrinkage during shipment to customer.

10—*Calendering*

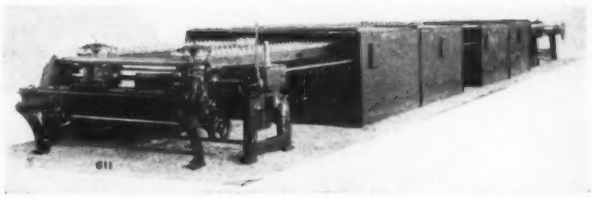
This operation is to help give the goods desired "hand and feel" not obtainable without it.

11—*Final Inspection*

This operation is passed on by chief inspector, responsible for approving goods for shipment. Comparison of white, hand, draping qualities, etc., are checked against standard received from customer.

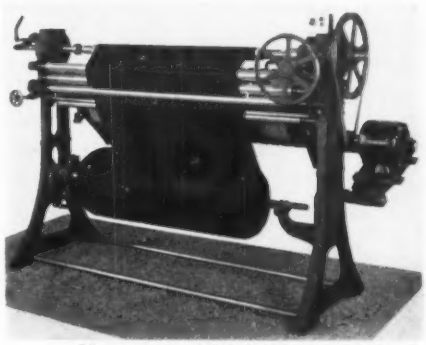
12—*Tubing and Shipment.*

On the finishing of the whites, it is very important that all softeners and finishing agents be tested to see that they are free from any property that may cause the "blued" whites to turn greyish, and numerous other troubles that develop when these agents are not properly checked before applying them in a finish. Certain tests can be run that will simulate actual results obtainable if goods were finished with these agents and then stored before shipment to customer. These tests accelerate the ageing action through using heat and no ventilation, and can be run in plant laboratory.



Photo, courtesy, Van Vlaanderen Machine Co.

Fig. 10—Tenter Frame Equipped with Housing. This is one of the latest types with swivel let-off, slip belt take-up, power opening and closing devices for the tenter rails, variable speed drive and clip oiling device.



Photo, courtesy, Van Vlaanderen Machine Co.

Fig. 11—High Speed Tubing and Measuring Machine. This is one of the latest types for high speed tubing and specially engineered to insure accuracy in measurement.

Use freshly bleached cloth cut from goods off first drying before any finish has been applied. Make up known strength solutions of the agents under test, apply them by running through hand wringer at 160° F. several times to be certain that excess finishing material are on goods, and hang in small oven at a temperature of 90° F-110° F. for 48 to 96 hours or longer if desired.

If the goods are free from an odor at the end of this test and show no discoloration or yellowing when compared to a piece of the bleached crepe that has been run under similar test conditions, then such agents can be approved and run without danger on white finishing.

For the average crepe of the 2 by 2 acetate viscose rayon type, this is considered a good running formula for finishing whites:

No. 1	No. 2
3	6 quarts sulfonated tallow
3	4 quarts sulfonated olive oil

Prepare mix cold, heat to 160° F. with stirring until thoroughly in solution, add necessary delusterant dulling agent if desired and make up to required volume of 40 gallons, and run on quetsch.

No. 1 finish will give a soft medium-bodied hand, while No. 2 will give a soft but a heavier-bodied hand which is sometimes desired by the customer. Finishing will be taken up in more detail under the dyeing and finishing of acetate and viscose rayon crepes in a subsequent article.

(To be continued)

Are

Dyes and Finishes

Liable to Cause Skin Afflictions?

NOEL D. WHITE

ON several occasions I have been asked if there was a possibility of getting skin poison from wearing dyed garments next to the skin, which I invariably answer in the negative. Quite recently I read with a great deal of interest an article, which appeared in a textile magazine, cautioning manufacturers against execution of product liability guarantees and it reminded me of an experience I had some years ago with some hosiery I had dyed a navy blue, and which brought the mill to defend a lawsuit.

That hosiery was knitted with silk on the leg and mercerized cotton tops, heels and toes. The sample I had to match was a pair of ingrain dyed, all silk hose. To obtain a satisfactory match on that dark color and a good union on silk and cotton I had to use a high percentage of direct dyes, besides the necessary acid dyes for the silk, all of which had to be selected from the products of several dyestuff manufacturers. (The dye industry at that time was still quite young.)

One day, some months after that shade of navy blue had been distributed among our customers, I was called to the office to explain why a customer had contracted a skin disease from wearing our navy blue stockings.

To my regret, this time I did not know the answer. I had known dyers to get infected hands and finger tips from working in sumac, tannic acid and bichromate baths; of others losing finger nails because their skin could not stand prolonged working in soap baths, and had seen caustic alkalies cause skin eruption in some men, but had never known of anyone getting infection from working with dyestuffs. If there had been surely I would have heard about it, in the forty years that I have been in the business and using dyestuffs.

The complainant had a lawyer suing the store for heavy damages for his client, claiming the dyes had caused the poisoning (a rash of the skin in the leg and feet). That being at a time when the dye industry had just started in this country, was being subjected to adverse propaganda, and the people were being prejudiced against our ability to produce good dyes. The store owner, who had sold those stockings, turned over the complaint to our consideration since our mill guaranteed to replace any hosiery which did not prove satisfactory. This however was not a case of replacement and my employer feared a long lawsuit was impending.

To make the matter worse for me our superintendent also was inclined to believe the dyes were to blame, because he had been afflicted with an irritation of the skin caused by wearing cheap hosiery which had been dyed black by the aniline oxidation process, and now would wear nothing but white hosiery, claiming all dyes were poisonous.

It would have been an easy matter for us if all the dyes in that shade had been purchased from one dealer. We could have put the blame up to him and leave the matter in his hands. Since there were three different dyestuff dealers represented in that navy blue formula our counselor requested I should give him a copy of the formula with a sample of all the dyestuffs that were in it. Just what he did with it I do not know, but when the case came up in the courts it was promptly quashed, and we never heard anything more about it.

It must be remembered, however, that at that time our hosiery was finished in an acidified bath containing but one-half per cent acetic acid, and one per cent of an emulsion made of olive oil boiled with soda ash, which gave the hosiery a brilliant, soft finish, with just a trace of scroop, but nothing to affect the most delicate, sensitive skin. The ground for complaint in that navy blue case had been the slight bleeding of color found in washing the hosiery, from the high percentage of direct dyes needed for such a dark shade. No amount of washing on our part, necessary to prevent bronzing in drying the hosiery, and a warm soaping with olive oil soap could eliminate entirely such innocuous bleeding of the dye.

Since that time, however, many changes have taken place both in dyeing and finishing hosiery. More and better dyestuffs have been provided to make dyeing easier, better and faster. Finishing has become more exacting and intricate; the flimsy, sheerer hosiery requires some filler to take the place of the reduced size of the knitting silk; stiffening pastes to straighten the loops and correct any knitting imperfections; and most important of all, the natural silky luster, so desirable in the past, now has to be subdued to the dullness of the bare skin, besides making the fabric spotproof, waterproof and wrinkleproof, all of which require a number of chemicals to tax the proficiency of the dyer and the ingenuity of the purveyors of finishing materials.

The chances of the latter chemicals giving the wearer of hosiery skin affliction will be discussed presently. As for the dyestuffs, Dr. Louis Schwartz, senior surgeon of the U. S. Public Health Service, gave his decision in

a paper entitled "The Actual Cause of Dermatitis Attributed to Socks," this being part of a report of the result of tests conducted by the Research Associates of the Hosiery Association on a case of skin irritation. Some manufacturers had been faced with possible lawsuit for damages claimed by a customer who had alleged that the dye from a certain hose had caused skin irritation. Dr. Schwartz said: "We have been unable to find any substance in the submitted half hose which is apt to exert a poisonous or even an irritating effect on the skin of a wearer whose skin is not hypersensitive. If the wearer is one whose skin possesses some peculiar idiosyncrasy it is possible that he may suffer some irritation . . . no cause for condemning the half hose as poisonous. The fault lies with the wearer and not with the hosiery . . . bleeding of the dye doubtless caused alarm on the part of the 'washer' and when subsequently was taken with a skin infection blamed it on the dyestuffs."

Dr. Schwartz also said that he found one of the patients, who complained of dye poisoning from socks, had a skin sensitive to alkaline solution and the irritation was traced to a sulfonated castor oil finish used on the socks which was markedly alkaline. This patient was also found to be sensitive to a 1 per cent solution of olive chip soap, therefore, it is not unlikely that the soap used in washing the hosiery may have caused the infection.

DANGER IN FINISHING?

Since delustering has become the fashionable requisite in finishing silk hosiery there have been a number of compounds put upon the market under many proprietary names. Barium sulfate has been known and used for a long time for reducing the silk luster in fabric requiring a dull finish. Being quite insoluble its application had to be modified when used in finishing silk hosiery in dyeing machines. The more soluble barium chloride was preferred by many, but delustering with it required a second bath with sodium sulfate, thus giving the hosiery a very subdued dull finish. Zinc salts in various forms have been used, the sulfide having found much favor with some dyers for delustering hosiery, and quite recently I was handed a copy of the "Dyer and Textile Printer" in which there was marked, for my attention, an editorial pointing out the danger of using these compounds on silk goods intended to be worn next to the skin.

In this article the writer calls the attention of finishers of hosiery to the poisonous properties of the soluble barium compounds and zinc salts, and emphasizes the importance of removing all possible traces of these substances from the finished goods, when used in delustering them. It cites the unpleasant experience of hosiery wearers who observed an objectionable smell, apparently emanating from the hosiery after a period of perspiration. Others complained of experiencing scaling on the soles of the feet and irritation on the calves of the leg.

The suspected stocking having been subjected to an artificial perspiration and analyzed, it was found that any remnant of zinc sulfide, being dissolved by it, would develop a strong smell of hydrogen sulfide, thus justifying the complaint of the customer. Further tests with the artificial perspiration showed also that any barium sulfate remaining in the hosiery would dissolve, and is liable to be absorbed by the perspiring skin with unpleasant results.

It was found upon investigation that the alkalinity of perspiration varies not only in the different individuals, but also in different parts of the same person. Quoting from the "Dyer and Textile Printer": ". . . from reports published, the acidity of perspiration examined appears to vary from a pH of about 4.0 to over 7.0. One reference states that sweat from the leg and lower part of the back has a pH of 4.6 as against 7.0 on the face, and adds that this may be explained by the fact that acidity decreases with the washing of the surface."

From which it would appear that the public who buys should be educated to bathe frequently in order to prevent possible poisoning from infected, dull finished hosiery. But since no merchant would dare tell a customer to wash his or her feet frequently it is natural he should seek security by demanding product liability guarantees. The fact, however, is that dull finishing as it is done today can be made quite harmless to the most allergic individual.

Some delusterers can be put into the dyebath along with the dyestuffs, giving the hosiery a very pleasing dullness. When the batch is washed and finished the last trace of any chemical is so well neutralized that any possibly danger is eliminated. The trend being toward a milder dull finish for silk, there is no longer need of injurious chemicals being used. Delustering hosiery is no longer the long drawn out operation it used to be, which spoiled the match and caused the dyer so much trouble. It can be done now with a number of innocuous preparations any responsible dealer in finishes can easily provide.

A PERSPIRATION PROBLEM WAS SOLVED

Since the effect of perspiration is so variable with different individuals and the skin of some persons sensitive to things to which others are totally immune, it would be hard to advise upon a safe way of procedure, for dyeing and finishing, to avoid liabilities if guarantees are executed. Guarantees could be claimed against colored fabrics which have faded through the perspiration acidity or alkalinity of individuals, over which the manufacturer has no control.

We had a trying case once which demonstrated the effect of perspiration from different persons on dyed hosiery, which we finally solved in a unique manner and may be of help to others. It happened years ago, when fifty per cent of our production was dyed black. Complaints had been received from customers in various parts of the country that the black in our hosiery turned green in the heels and toes after only a short time of wearing, and we had to replace the hosiery because of the guarantee we gave with every pair that was sold.

Besides being costly the matter was puzzling because

that black was dyed and diazotized, then developed with a mixture of beta-naphtol and meta-phenylene diamine and we thought it was the fastest black for that purpose, which was supposed to be ungreenable. All of us in the mill who wore black stockings so dyed were willing to swear to it.

Then one day one of our office girls bought a pair of our black stockings and after a short time brought them back with the complaint that the black was no good and it had turned green after only two washings! With the evidence confronting us we could now investigate the matter thoroughly. As in the case of our customers who had complained, we gave her more black stockings to wear, but instructed her to report any changes in color as soon as noticed and from then on we used her to test all our colors before sending them out to our trade, using her as a sort of a guinea pig to test our products. We discarded that developed black in favor of another which we after-treated with formaldehyde, adding two per cent of potassium bichromate and acetic acid in the aftertreating bath and no more greening feet were brought to our attention.

Since it is well established that most troubles affecting the fastness or quality of textile materials, and the effect they may have on the sensitive skin of some of the wearers, have been caused by perspiration, the manufacturer could hardly be held liable to damages. Product liability guarantees would cover a lot of territory so to be on the safe side look for a guinea pig among your personnel.

TRADE NOTES • NEW PRODUCTS

• REFINED PRODUCTS CORP.

Announcement is made by Fred Weller of the formation of the Refined Products Corp., 1000 Narragansett Blvd., Providence, R. I. Mr. Weller states that the company has been organized "for the purpose of originating and developing textile processing materials of the highest quality and in conformity with recent

FRED WELLER

discoveries toward better and more permanent effects on fabrics." Referring to his associates Mr. Weller said: "Associated with me in this organization is a group of highly trained men, each one a recognized specialist in his field. Individually and collectively it is our purpose to serve you to the very best of our abilities."

Attention is called to a new product, PermaPar, which is a cat-ion, substantive compound said to attach itself permanently to all cellulosic fibers and is thus a permanent softener. It is stated that this product is made from the finest ingredients obtainable, that it is absolutely pure, that it will not stain white fabrics and that it will not change color shades. It is claimed that the concentration is so high that by its use finishing costs will be lower, in most cases, than has been possible for comparable results. It is further claimed that it is unaffected by laundering, dry cleaning or perspiration and that when used as a print wash it will set most colors and make them more brilliant.

• GENERAL RELEASES

General Dyestuff Corp., 435 Hudson Street, New York City, announces release of circulars describing the following products:

Benzo Fast Bordeaux 5 B L—a direct dyestuff which produces on cotton as well as on rayon full shades of claret said to possess good fastness to light. The product is said to be well suited for the dyeing of silk-wool unions. It is stated that it leaves acetate rayon perfectly clear. Circular GDC-152.

Diazo Discharge Violet R D—which, when diazotized and developed with Developer A, produces very bright shades of reddish violet on cotton or rayon. The dyeings are said to be fast to washing and to be easily discharged to a very clear white. Circular GDC-151.

• DYESTUFFS

Copies of *Dyestuffs*, quarterly publication of the National Aniline & Chemical Co., 40 Rector Street, New York City, for September, 1938, have recently been distributed. Featured in this issue is an article entitled "The Canvas Disc Wetting Test" which also appeared in the September 19th, 1938, issue of AMERICAN DYESTUFF REPORTER. Also appearing in this issue are articles described by the following titles: Men and Women's Shoe and Leather Colors for Spring, 1939; Spring 1939 Colors for Women's Gloves; Dry Color Methods; The Determination of Alkali in Wool. Copies of *Dyestuffs* are available upon request to the publishers.

• MORTON CHEMICAL CO., INC.

Incorporation of the Textile Chemical Products Co., under the name of Morton Chemical Co., Inc., with authorized capital stock of $100,000, has recently been announced. Office and plant remain at the same address. 2110 High Point Road, Greensboro, N. C.

Joseph R. Morton, who with J. D. Pell, founded the company in 1931, to manufacture warp sizing compounds for rayon mills, was elected president and treasurer of the company. R. B. Morton was elected vice president and W. H. McCormick, Jr., was elected secretary. Directors of the company will be Joseph R. Morton, R. B. Morton and J. D. Pell.

S. V. Valjavec, who succeeded Dr. A. R. Macormac who is now head of the chemistry department at Alabama Polytechnic Institute, Auburn, Ala., is chief chemist of the company.

Announcement is also made of the letting of contracts for extensive additions in equipment which include a 3000-gallon mixing kettle, a 1500-gallon high vacuum still with necessary condensers and feed tanks, an acid mixing tank, a 500-gallon esterification still, a large vacuum pump for use with the stills, a large filter press with steam pump for use in the clarification process and a gas-fired oven to be used for coating.

The new company, in addition to the manufacture of its own line of chemicals, will continue to represent the M. Werk Co., of Cincinnati, Ohio, on textile soap, the Atlantic Refining Co., on white oils and the Diamond Alkali Co. of Pittsburgh, Pa.

• S.O.C.M.A. MEETING

The first fall monthly meeting of the Synthetic Organic Chemical Manufacturers Association of the U. S. was held at the Chemists' Club, New York City, on Friday, September 16th, 1938. The meeting was opened with a brief eulogy of the association's old president and leader, Dr. Charles H. Herty, by President Merz. Then followed the secretary's report on various matters of interest to the members. It was announced that the next meeting of the association would be held on Thursday, October 20th, at 12 noon.

• STANNOCHLOR

Announcement is made by the Prior Chemical Corp., 420 Lexington Ave., New York City, of a new chemical known as Stannochlor which is anhydrous stannous chloride. It is claimed that Stannochlor has important advantages over Tin Crystals (stannous chloride) which has long been widely used in the textile industry as a reducing agent in the manufacture of chemicals, intermediates, dyes and lakes. Among the advantages claimed are: high stability, a high degree of purity and a high concentration. A booklet describing these advantages in detail is available upon request to the company.

• FOLDER ON KETONES

Carbide and Carbon Chemicals Corporation announces the publication of an attractive new folder entitled, "Synthetic Ketones." Known as "Chemical Group Folder No. 6," this publication is the first of a series of new folders which are designed to present, briefly and concisely, information on various organic chemical families. The present folder covers the applications and properties of fourteen synthetic ketones which are used as industrial solvents and intermediates. A convenient table shows boiling points, vapor pressures, solubilities, and other properties in a form in which they can be easily compared. Other folders of the series, soon to be published, will give similar data on alcohols, glycols, amines, acids, and other organic families. Copies of "Synthetic Ketones" can be obtained from Carbide and Carbon Chemicals Corporation, 30 East 42nd Street, New York, N. Y.

• JOINS RODNEY HUNT

The Rodney Hunt Machine Co., Orange, Mass., announces that Mr. Bliss M. Jones, formerly of The Philadelphia Dry Machinery Co., has become associated with them in the promotion and sales of their Wet Finishing Machinery.

Mr. Jones' broad experience in the Textile Field has placed him in position to aid in the solution of many wet finishing problems, and with the recent allowance of several new patents the "Rodney Hunt" line moves forward in its service to the industry.

• CIBA REVIEW

Ciba Review, Number 13, has recently been distributed. The theme of this issue is: "Guild Emblems and their Significance." Articles appearing in this issue are described by the following titles: Guild Emblems and their Significance; Paintings and Emblems of Venetian Guilds; Artistic Trade Marks; Emblems of English Tradesmen and Merchants; Historical Gleanings.

Also included with this issue is a supplement entitled: "Dyeing Raincoat Material." A selection of colors for use in dyeing raincoat materials is given, with attention being paid to the type of material and properties required.

Copies of *Ciba Review* are available upon request to the Ciba Company, Inc., P. O. Box 25, Station C, New York City.

• WITH MIXING EQUIPMENT

C. S. Quillen, Ch. E., has been placed in charge of field engineering for the Mixing Equipment Company of Rochester, New York, in New York City and Central Southern territories. For the past several months he has been assisting with development work at the Rochester plant. A graduate of Drexel Institute, Mr. Quillen was formerly with Alco Products, and Carbide and Carbon Chemical Corp. Mr. Quillen will maintain headquarters at 377 Broadway, the New York office of the Mixing Equipment Company.

• NEW WATER REPELLENT

In order to provide a highly concentrated source of soluble aluminum for the water repellent treatment of textile fabrics, the Niacet Chemicals Corporation, 4707 Pine Avenue, Niagara Falls, New York offers two new soluble aluminum acetate salts under the trade names, "Niaproof" and "Niaproof" B.

"Niaproof"* contains 37 to 39 per cent of alumina as Al_2O_3 and is said to dissolve readily in water to form solutions of any desired concentration. The pH of "Niaproof" solutions, an important factor to consider when compounding any aluminum salt with wax emulsions, varies from 5.1 at 32 per cent concentration to 5.4 at 1 per cent concentration. If solutions of lower pH are desired, the addition of small amounts of Glacial Acetic Acid will give solutions as low as pH 3.6.

"Niaproof" B is a more basic type of aluminum acetate salt containing 35 per cent of alumina as Al_2O_3. Solutions are prepared by dissolving in almost boiling water with violent stirring. Such solutions have a pH range of from 4.7 at 32 per cent concentration to 4.8 at 1 per cent concentration, and lower values may also be secured by the addition of Glacial Acetic Acid.

*Trade-mark.

• MEETING, A.A.T.T.

The last meeting of The American Association of Textile Technologists was held at the Architectural League Club Rooms, 115 East 40th Street, on September 14th, at which time 52 members and guests were present. The speaker of the evening was Roy A. Cheney, managing director of the Underwear Institute, who spoke on the timely subject: "Truth in Fabrics." He first called attention to the old method of selling, namely, "Caveat Emptor" otherwise known as "Let the Buyer Beware," and stressed how this old method is gradually devolving into a newer one where the buyer is given factual information in advertising, labels, tags, etc.

He went on to say, in part, "Due to changes in our civilization and methods of production, distribution, etc., coupled with wide-spread use of advertising, there is no question in my mind but what the buyer is entitled to know exactly what he or she is purchasing. Today the average woman is not familiar with even the so-called natural fibers, such as cotton, wool, silk and linen to say nothing of her unfamiliarity with the new synthetic fibers or with the manipulation of these fibers whether by themselves or blended."

And he added, "We can produce things which are entirely different basically from the things we are familiar with but which look the same, and of course it is quite human and almost a rule of conduct in every phase of life that we try to make the new things take on the aspects of the old, particularly at the inception of these new things;" and declared further, "I believe that this organized drive for 'Truth in Fabrics' is just at the beginning of its accomplishment. Public opinion has swung to the point where it will insist that the producer and distributor make known to the consumer the contents of

the product. With regard to this, as with a great many other new movements which have been started within the last four or five years, I am in complete sympathy. But in regard to this, as well as to others of these new movements, I am definitely against any autocratic method of application and enforcement. As I see it, the trouble has been recently that these efforts for reform have gone too far beyond the reform involved and have, in effect, sought to change our system of government."

The next meeting will take place at the same address October 5th, at which time the lecturer will be Edward Robinson Schwarz, Professor of Textile Engineering at Massachusetts Institute of Technology, Cambridge, Massachusetts, who will speak on the subject "Frontiers of Modern Textile Technology."

OPEN FORUM

Rules under which this department of the REPORTER is conducted are as follows:

1. Anyone who has a technical problem on which he would like advice may submit it to the Reporter and it will be published in the first available issue.

2. Any reader who feels that he has a solution of the problem may forward his reply to us and if we feel that the reply is suitable it will be published in a succeeding issue.

3. For each such reply published the Reporter will pay a minimum of $2.

4. In case there is more than one answer to the same question, the one covering the subject in the most complete and authentic manner will be published, or if two answers are sufficiently different both will be published. If two answers are considered equally good, the one first received will be given priority.

5. The Reporter will assume no responsibility whatsoever for the accuracy of the answers submitted—it is simply offering a vehicle for the public expression of its readers' opinions.

6. Both the questioner and answerer must send in his complete name and address. When requested we will publish only the initials or other identifying insignia.

Answer

47—Please give remedy for skeins floating in vat dyeing of unmercerized cotton in machine, when 8 hour boil out has been given in a well designed box kier (pressure type kier not being available).—**W.S.G.**

Answer—To prevent skeins of unmercerized cotton floating in vat dyeing in machines this naturally could be overcome mechanically by using a Klauder Weldon type machine in which the skeins are kept taut, but I presume such a machine is not available.

The writer's experience has been that penetrants and dye assistants have been of no avail, but he has met with success by hydro-extracting the goods before proceeding to dye, and also previous to making any additions of color. This naturally entails more handling, but prevents the floating and the subsequent streakiness caused thereby.—T. F. A.

Unanswered Question

46—A discussion has arisen in our plant as to the actual physical causes of scroop on silk fibers. Is this effect visible under the microscope, and if not, what is the actual physical change between unscrooped and scrooped silk? Several theories have been evolved with regard to this, none of which seem to hold water, and I would appreciate it very much if some one could assist me in shedding some light on this subject.—**A.G.A.**

CLASSIFIED

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

POSITION WANTED: Finishing plant chemist desires responsible position. Expert on vats, napthols and other cotton and rayon dyeing. All types of control work and testing. 26 years' experience on yarn and piece goods. Write Box No. 993, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED: Plant-chemist, technician desires position with dyeing or printing organization. Can take charge or supervise the processing of rayon, acetate, spun rayon and cotton fabrics, also lastex corsets and swim suitings. Can supervise laboratory control and research, economy in dyeing and finishing. 14 years of practical experience with leading organizations. Write Box No. 146, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED: Three years' experience in dyestuff laboratory; also demonstrated. Experienced with all types of dyestuffs and materials. Philadelphia Textile School graduate. Age 23. Single. Write Box No. 152, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED: By New Bedford Textile School Graduate; Chemistry, Dyeing and Finishing course. Age 22. Good laboratory worker. Will start at bottom and make good if you give me the opportunity. Write Box No. 153, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.

POSITION WANTED: Colorist desires position that will lead to demonstrator opening. Understands all classifications of dyestuffs and application to respective fibers. Practical knowledge of vat and soluble color printing. Eight years' experience. University training. Age 30. Excellent references. Write Box No. 154, American Dyestuff Reporter, 440 Fourth Ave., New York, N. Y.